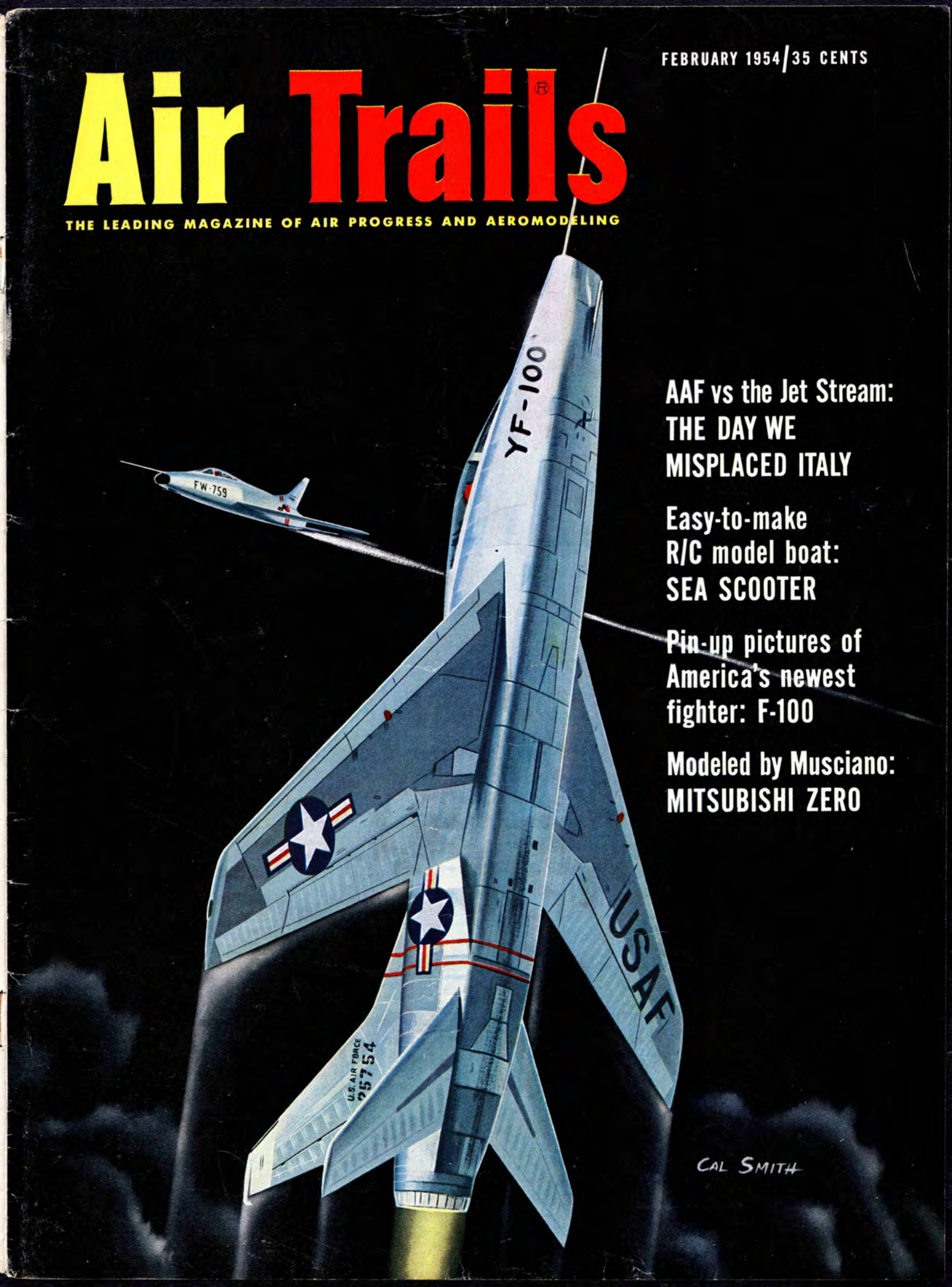
FEBRUARY 1954/35 CENTS

Air Trails®

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING



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Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

Cover: North American F-100 Super Sabre, AF's latest fighter. First service craft capable of sonic speed in level flight. Now just going into production, the F-100 should be a decisive instrument in maintaining peace.

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FROM THE READER

R/C Booklet...I have always been a free flight man and was never very interested in the other aspects of modeling. However, there comes a time in every man's life, or so it goes, and I have had mine. Mainly I want to get going in radio control.

Can you give me any help or advice on radio control? What I mainly am interested in is what kind of ship shall I build? What kind of power for the motor? What transmitter? What receiver? What escapement? What channel? Believe me, I'm lost!

Is there any way that I can purchase complete parts for the Little Locator (described in last August issue) in kit form or otherwise?

Cpl. George S. Prochaska, U. S. Army

• A compilation of outstanding articles on radio control specially selected for the novice and reprinted from Air Trails is available from Hobby Helpers, 770 Hunts Point Ave., New York 59, N. Y. The booklet is called "Basics of Radio Control for the Model Builder" and sells for 35c. For information on parts for McEntee's Little Locator write Dover Electronics Co., 201 E. Blackwell St., Dover, N. J.

Captain Smith Reports...In your excellent 1953/1954 issue of Air Progress I note that you have given impetus to that ancient canard about the Thomas Morse Scout being a fighter. ("Fighters Then and Now!")

The Scout was built in my home town of Ithaca, New York, and this fact was influential in starting me out on a 20-year career in commercial aviation which led to a position as Captain on American Airlines.

I therefore owe much to the Scout, and hate to see it misrepresented. The Scout was not designed as a fighter, nor was it ever used as a fighter. It was designed as a training aircraft, it was so used, and no Thomas Morse Scout ever went overseas.

Everyone from the New York Times on down has, from time to time, referred to the Scout as a fighter. To old-timers who knew and loved the ship, this is a gross inaccuracy which they would like to see—once and for all—laid to rest.

Charles L. Smith, Ithaca, N. Y.

Model Aircraft Directory...We would greatly appreciate information or assistance in securing a list of model airplane company addresses in the United States.

We intend to have our cadets make various type models and wish to secure as complete a source list as possible.

Col. Austin L. Berry,
Professor of Air Science and Tactics,
AFROTC, Brooklyn College

• Most of the modelplane concerns in this country appear in the advertising columns of Air Trails. An alphabetical listing, complete with addresses and products, will be found in Air Trails Model Annual for 1954, on sale early in February.

Jap "Randy" and the Dirty Look . . . Have just read your 53/54 issue of Air Progress, and want to congratulate you on your efforts to complete the gaps of both U. S. and Jap military aircraft heretofore unreleased. The one aircraft that has always interested me the most was the one on page 46 in this edition of Air Progress, the P-66 Vultee Vanguard.

I myself have seen both the air and liquid cooled engine models. I never could understand why this plane was released to foreign countries. You mentioned some were shipped to Sweden. A number of these were also shipped to England and subsequently they in turn shipped them to Nationalist China; hence, the Japanese derived their famous "Zero" fighters.

I spotted a Jap twin-engined fighter similar to your designated "Randy" KI-83, as early as Sept. 1942 in the South Pacific. I thought it was an Me. 110 released to Japan from Germany. I reported it as an Me-110, at which I received a dirty look. You have convinced me I wasn't too far wrong in what I saw, as it does resemble somewhat the Me-110.

Don't you agree?

Gilbert V. Wolloff, Somersworth, N. H.

Supersonic Job . . . In your issue of Air Trails of November 1952 the aircraft in the story "Interceptors Beyond Sound" was very interesting to me so I thought I would make a plan and a model with a few changes such

as an air intake behind the canopy. I am enclosing photos of the model.

Fred Young, Linden, N. J.

Endurance Model...A few months ago an Associated Press dispatch appearing in papers throughout the country electrified all aeromodeldom with the news that 14-year-old Sherman Holt of Fayetteville, N. C., had set a new world endurance record for model planes of 8 hours, 31 minutes and 50 seconds with a controliner. Refueling through a plastic tube running up one of the lines, he considerably bettered the former record of 1 hour and 35 minutes. And as estimated in subsequent reporting of the event by *Time* magazine, "if the model had

(*Continued on page* 9)

All communications to the editors should be addressed to 304 East 45th St., New York 17, N. Y. **Subscription prices:** U. S. and Possessions—$3.50 per year, $6.00 for two years; Canada—$4.00 per year, $7.00 for two years; countries of the Pan American Union—$7.00 per year, $10.00 for two years; elsewhere—$10.00 per year, $14.00 for two years. **Please advise us if you move,** giving old address and new address; allow four weeks for change of address; address all subscription mail to **Air Trails Subscription Department,** 304 East 45th St., New York 17, N. Y.

How I foxed the Navy

by Arthur Godfrey

The Navy almost scuttled me. I shudder to think of it. My crazy career could have ended right there. Who knows, I might still be bumming Chesterfields instead of selling them.

To be scuttled by the Navy you've either got to do something wrong or neglect to do something right. They've got you both ways. For my part, I neglected to finish high school.

Ordinarily, a man can get along without a high school diploma. Plenty of men have. But not in the Navy. At least not in the U. S. Navy Materiel School at Bellevue, D. C., back in 1929. In those days a bluejacket had to have a mind like Einstein's. And I didn't.

"Godfrey," said the lieutenant a few days after I'd checked in, "either you learn mathematics and learn it *fast* or out you go. I'll give you six weeks." This, I figured, was it. For a guy who had to take off his shoes to count above ten, it was an impossible assignment.

I was ready to turn in my bell-bottoms. But an ad in a magazine stopped me. Here, it said, is your chance to get special training in almost any subject—mathematics included. I hopped on it. Within a week I was enrolled with the International Correspondence Schools studying algebra, geometry and trig for all I was worth.

Came week-end liberty, I studied. Came a holiday, I studied. Came the end of the six weeks, I was top man in the class. Within six weeks I had mastered two years of high school math, thanks to the training I'd gotten.

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Buried in This Ad

are most of the new items. Sometimes there isn't time or space to list all of them. But, if available anywhere, we have it.

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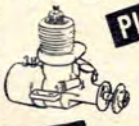
PLUS  ROYAL SPITFIRE .065

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Nine-pound helicopter by John Burkan, Rutledge, Pa. Powered by Forster .99. Timer actuates throttle; tail rotor turns at half engine speed, main rotor ⅛th engine speed.

Wanna make history? Be a Washington!

■ Here's a hot tip to PAA-Load flyers in the vicinity of Washington, D.C. Pan American World Airways is hoping to work out a special Washington's Birthday exhibition event whereby modelers will carry silver dollar payloads across the Potomac River in PAA-Load free flight models. Awards will be on the cash side! Your name in papers from coast to coast! Imagine duplicating the feat of athletic George (USA's Washington, not PAA's Gardner!).

Now don't go arguing with us about what river it really was, and was it a silver dollar . . . we'll leave that to the historians. But for the inside story of the Potomac Peso Payload event, we suggest all Virginia, Maryland and District of Columbia modelers contact Carl Wheeley at the Academy of Model Aeronautics.

Academy Turns Twenty. Although we've heard no official word from Washington on the subject, we're pointing out that 1954 marks the 20th anniversary of the Academy of Model Aeronautics. Twenty years! Two decades! A score! Golly, we'll bet none of the model leaders who met rather casually in Akron in 1934 and the following year in St. Louis during the National Competitions thought their discussions would culminate in a 20-year-old some day.

But that's the way it worked out. The original purpose of the AMA which in those days was known as the American Academy for Model Aeronautics was to lend direction to the air-modeling movement, advise the National Aeronautic Association and its Junior NAA Division on modelplane rules, and confer honors on outstanding model designers, contest flyers and activity leaders. Also considered of importance was the need for an annual technical conference and the regular presentation of scientific papers dealing with all phases of aeromodeling.

Back in 1935-36, Academy headquarters for a time were at the Institute of the Aeronautical Sciences in New York City. For a brief, glorious period Frank Zaic published an Academy bulletin which he called "Model Aviation." A serious attempt was made to interest various segments of the full-scale aviation industry in modelplane work; it was hoped the aircraft manufacturers and airlines would lend financial support to the AMA.

That effort failed, but not for lack of hard work on the part of many. When some funds were forthcoming after a prolonged period of research and evaluation they were earmarked for an organization called the Air Youth of America. There was a lot of noble effort behind AYA, so much so that it is a separate story in itself. AYA was a sort of super AMA combined with a Junior Birdmen type of mass membership club—it didn't last too long.

In 1939 the Academy took over the functions of the Junior NAA and various "national" modelplane groups. With no outside financing, but leaning on the NAA bank account during slow periods, the AMA undertook the prodigious task of supervising, policing, encouraging and promoting model aviation everywhere in America. And all this on the 50c and $1 fees collected from the modelers themselves.

Although 50c went a lot farther in those days than now, it didn't travel near far enough to enable the Academy to work on any sort of basis other than "shoestring." What started out as a high-flying technical society and honors group suddenly found itself in the mass membership business with no budget, no experience, nothing except a belief that modelplane building and flying was a darn good hobby.

Just at that point it would have been wonderful had the American aircraft industry stepped in and said, "Here's $10,000—let's see you set up this organization the right way and get some permanent sponsorship." But, no, even today that's still an idle dream. (Never in the history of any activity have those who stand to benefit the most—the aircraft industry—contributed less! Whence come the aircraft designers, the skilled workmen, the intrepid pilots of tomorrow? From the ranks of model builders, of course!)

So, unaided, with some little guidance from NAA, the Academy blundered on. Somehow the major jobs were done. A unified competition code was established. "Chapter" clubs were aided and encouraged. Insurance coverage was arranged for contest flyers. Technical information was disseminated to leaders—some filtered down to license- (*Continued on page* 10)

(*Continued from page 4*)

been flying in a straight line it would have covered 357 air miles."

Herewith the fellow who made all these figures possible tells the story in his own words for "A.T." readers:

Ever since I was large enough to know what an airplane was I have been very fond of them. At the age of six I made my first model. It just happened last year that I became interested in models with motors. In the Spring of '53 my father (E. W. Holt), C. W. Cronise, Harry Stampey and I combined our ideas and invented a way to refuel the aircraft from the ground. This was by a plastic tube which ran along the control wires and was made possible by a hand pump which pumped fuel to the tank. The endurance trial was made possible by the Fayetteville Fire Dept., Piedmont Airlines, Exchange Club and the Circle Burner Model Club of Fayetteville.

Mr. C. W. Cronise and I used a Fox .35 with a 10/6 Power Prop, and a V-G-2 Champion Glo-plug, in a Sterling Ringmaster. The flight came to a stop when the fuel tank vibrated loose.

Sherman E. Holt, Fayetteville, N. C.

Air Progress Aids Thesis . . . Your magazines were a great aid in preparing my report on "Aviation and the II World War." My report was assembled with pictures and information from Air Progress and other books, these added to the comprehensive power of the thesis. Air Progress pictures were the only ones I used because they covered my topic so completely.

Joseph J. McDonnell, Jr., Woodside, N. Y.

Scouts Take to Air Trails... Just a note of thanks for the back copy issues of "A.T." you sent out for our Cubs Pack Meeting. The boys were quite thrilled with them.

Ruth L. McCarthy, Emerson, N. J.

Big Plane Listing... My friend and I both buy Air Trails each month. I missed the issue in which you had the addresses of the various aircraft companies. I would be very much pleased if you would send me such a list.

William Burke, Providence, R. I.

● A complete listing of all aircraft manufacturers with their address and products is scheduled for the next Air Trails Model Annual which goes on sale early in February.

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(Continued from page 8)

holding members. More and more meets were sanctioned which meant uniform procedures.

By the time war came along the AMA had about 5,000 licensed flyers, 300 leader members and a considerable number of "affiliated" associates. For the most part affiliated members belonged to a model group organized by a newspaper or department store; for a fixed fee all the members of one club would be gathered into the fold for some ridiculously small fee. This dodge enabled such clubs to conduct sanctioned meets; it harkened back to the Junior NAA days when some NAA folks were trying to build up a junior aviation organization of a million or more youthful members. Just didn't work out. Instead of joining the Junior NAA, these airminded young men waited a couple of years and then signed up for some real aviation activity—in Uncle Sam's air force at the outbreak of World War II.

The big problem with the Academy is that it has had to be all things to all men. To safeguard the modeler, protect the sponsor and insure the safety of the public it had to concentrate on "fly safely" campaigns and contest rules. At the outbreak of war it put a time limit on free flight endurance to cut down out-of-sight flying. This was necessary because of the nervous aircraft spotters; otherwise model flying might have been curtailed completely by government order.

This edict was attacked bitterly, primarily in the pages of Air Trails by uniformed experts. The prestige of the AMA suffered among the modelers as a result of this, although defense officials in Washington applauded the Academy's flight limit stand and permitted a few model gas engines to be made for educational purposes. This was all during the strict metal rationing period, too. Odd thing is that the AMA's severest critic later recanted and wrote in "AT" that curtailing flight times was the proper action to take. Funny thing is that today such arguments are strictly academic, since most all free flying models have a maximum time limit for contest work or record.

All of this so far concerned but a single phase of the organization's work—contest rules. In addition, there has always been the need to dig up a sponsor to foot the bill and provide the personnel to conduct an annual "National" model plane championship contest. No easy job. The worst thing that ever happened was when the Academy, desperate for a Nats backer, gave out the meet sponsorship privilege to an aviation education foundation supported primarily by the model plane industry. This "institute" thereupon farmed out the National meet franchise to the American Legion. Things got rather mixed up—to put it mildly. It took about three postwar years to straighten out that. During that period the U.S. Navy became interested in airmodeling and since then has helped greatly in the conduct of the annual championships by providing an air base and facilities each summer. More recently the National Exchange Club has held the National meet sponsorship option, but apparently that needs some overhauling, too.

So much for another small part of the Academy's job—seeing that a National meet goes on each year.

Since some U.S. modelers have always been interested in international competitions, the AMA has served as the American representative at world-wide air-model sessions. The Academy has even acquired a quasi-official status as the Federation Aeronautique Internationale's model contact in the United States. As a result of all this, the Academy is required to run off international contests or arrange for American teams to be sent abroad. Limited funds mean that not always do we get teams across the Atlantic; right now the AMA is worrying about $75,000—the sum necessary to pay transportation charges to bring foreign teams to the U.S. for the scheduled running off of the Wakefield rubber and F.A.I. power competitions next summer. Why pay the freight for the foreigners? If we don't they can't come; if they don't come, we'd have an international event without any entrants other than our own. What to do? Right now no one knows—but chalk that up as just another of the many activities of the Academy.

Little wonder the original "forefathers" of AMA could not foresee the long, hard 20 years. . . . So far we've touched on but three functions of the organization: contest rules, National meet sponsorship and international contest obligations.

There are plenty of additional jobs that come into the Academy headquarters in Washington, D.C., every day. Most of these get done. How—on such a limited budget—is the never-ending wonder. Although the Academy continues understaffed, overworked, and not much appreciated we salute it for its past accomplishments and wish it well for the next 20 years!

Lilliputs Teach Precision. That was the title given to an interesting report by Robert L. Hatschek on model engines which appeared in "The Iron Age." Bob, a well-known Eastern Wakefield flyer and contest designer, is associate editor of the publication. Herewith excerpts of special interest to model flyers—Hatschek has the floor!

"Production of . . . model engines is a little known . . . segment of the metalworking industry. More than that, the field is a training ground for precision workmanship and a reservoir of facilities for close tolerance defense subcontracting. Only the best of machine shop practice and ingenious special tooling and production methods can meet requirements. And these skills must be refined to a high degree.

"Competition is keen among manufacturers of these midget powerplants and, in general, they are turning out vastly improved products at lower than prewar prices. Engineering advances have raised power to weight ratio from about 0.3 horsepower per pound in the middle 1930's to some 1.5 horsepower or more per pound of engine weight today. This is considerably better than full size piston aircraft engines, and about ten times better than automobile engines.

"These midgets are far more rugged and less cantankerous than earlier versions. Prices for comparable engines are down an estimated 25 percent over the same span of years. Reason is increased demand and the precision mass production methods that naturally followed. Outline of a typical firm, McCoy Products Co., Culver City, Calif., and its production methods will tell the story . . .

"The firm entered the model business in 1946 with a miniature race car and engine. Prior to that it had been doing precision machine work for the aircraft industry. In that first year McCoy grossed $250,000. For '53 the company estimates gross sales will hit $980,000; for '54, $1,200,000 with the help of two new engines not yet introduced.

"The 15,000 square foot plant is equipped with eight automatic screw machines, a dozen turret and second operation lathes, six milling machines, drill presses, hand and automatic honing machines, several borematics, and smaller specialized machines for grinding, lapping, and finishing parts. Many of these have been specially redesigned for use on small critical parts.

"These machines are used with exceedingly fine accuracy. Piston and cylinder liner of the small 1.5 oz. diesel with a displacement of .049 cu. in. must be held to tolerance of 0.00002 to 0.00005 inch. Dimensions of piston ring grooves in the larger engines (a 13.5 oz. 'hot spot' ignition racing engine of .607 cu. in. displacement) are held between .0002 and .0005 inch. To assure this accuracy electronic measuring instruments calibrated in millionths are used for inspection.

"The plant's 55 production workers turn out 850 engines in a typical day—a rate which chews up 100,000 lbs. of carbon steel, 40,000 lbs. of aluminum and 10,000 lbs. of copper, brass and bearing alloys annually. This output occupies approximately 60% of the firm's machine time .

"Another war-born firm, K&B Manufacturing Co., turned to lawn sprinklers, then to model engines when peace returned. A product of this company powered an American model to the world championship in

(Continued on page 64)

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Directory of Aircraft Manufacturers and Engine Makers—These are all the full-scale airplane companies who make up the American, Canadian and British aircraft industries. You get the name and address of each firm and a complete listing of all planes or engines turned out by that concern. An invaluable compilation which will be of great service to modelplane builders and air fans in their reference work.

Director's Eye-View of National Radio Control Flying — Harold deBolt gives you his inside report on what type of radio models and equipment performed best in the big annual classic. Here's an easy-to-read, highly informative account which will be of interest to all and of special help to the would-be radio control flyer.

Republic P-47 Thunderbolt Fighter—One of Walter Musciano's finest control line efforts. Variations in the P-47 series are shown so that you may construct a P-47B, a P-47D or a P-47N. Any engine from .14 to .35 may be utilized. Truly a Musciano "masterpiece" of model engineering.

Kit Directory—In response to continuous requests for who-makes-what-plane-kit! More than 500 kits are listed as produced by America's leading model manufacturers. Addresses of 32 firms are given should you want to contact any for detailed information. Each model is named and designated as to type (free flight or solid scale, for instance); its wing span and size power plant recommended by the designers are also included. For the radio fans power boat models suitable for controlling remotely by radio are listed.

Convair Delta XF-92A Scale Model—Frank Lashek and Cal Smith got together on this control line presentation and it's a dilly! Mr. Lashek's model attracted enthusiastic applause each time he flew it during the past season. It's great for flying exhibitions and display work; it'll attract as much attention as a multi-engine model, yet is a lot easier to construct and operate.

Radio Controlled River Boat Model—If you're the languid, lazy type then "Swanee" is for you! This stern wheel paddle boat will take any type of radio equipment and you'll never have to worry about battery weights! Dimensions are not critical; you can hack and saw, change 'er as you please. But when you bring her out to your park pond, lake or inlet—brother, you'll be the big attraction.

Model Engine Roundup with Three-Views—Details and data on the popular power plants including the new diesels together with accurately scaled three views to help you in planning plane layouts and fuselage mock ups. You'll probably consider this so helpful it alone is well worth the price of the Model Annual!

Model Club Directory—An up-to-date listing of currently active clubs together with the names and addresses of contact men. All these groups have been in recent communication with Air Trails and all are looking for new members. In addition, details on a college model aero club which may well stimulate additional air-model groups in colleges and universities.

Hints, Kinks and "Here's How" Sketches—Dozens and dozens of helpful sketches and diagrams will enable you to build better models faster and easier. Many of these are by H. A. Thomas, acknowledged to be the best in the model aero art field. No matter what type of modelling interests you most you're sure to find lots of fascinating suggestions and aids.

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■ The San Valeers' big two-day meet at Rosamond Dry Lake will make conversation for some time to come. The weather man provided ideal conditions. The Dry Lake bed is undoubtedly the world's finest free flight model airport. Imagine if you can a field so big that the models can drift in any direction from the center and not get off it on a six-minute flight, a surface so flat that you can take a model off at any spot you want and so free from obstacles that no model can find any to hit.

The wind Saturday was somewhat provoking—it changed direction every half hour, first to the east, then to the north, then to the west, then to the south—it kept this up for six hours, then settled down steady from the south from 3 p.m. until sunset, when a northern wind came up. Until that point there were only 15 or 20 modelers on hand; non-model visitors, though, outnumbered us at all times, people who had never seen a model before, pilots who had their own real ships. We were even visited by transient planes from time to time—guys who were flying over and stopped in for a few minutes.

Scattered as the fellows were, we visited quite often while chasing ships; first we would drift over to their cars, then they would drift over to ours. The entrants parked upwind at the particular time they arrived, and consequently were scattered in all directions.

There were all kinds and types of models from hand-launched gliders to R/C jobs, stunt jobs, all classes of free flighters, towline gliders, just everything. One item was missing till two in the afternoon—thermals! However, there was plenty of good air, four-minute flights were common, as were 1:20 flights with hand launches.

The day was tops for testing and we had built a special wing for a Nordic—out of the car it came. The wing was so constructed that the last one inch of chord for the entire span was hinged and could be pre-set at any angle. A lot of flights were made with this trailing edge at various angles and we feel we do have some concrete facts piling up which will prove once and for all that undercamber is here to stay. For example, with the flap in normal position durations around 35 seconds were obtained with a short towline; the fast flat glide seemed to have a lot of sink. As this flap was deflected on subsequent flights time in the air climbed until flights of 1:05 to 1:10 were consistent, this latter after the flap was deflected three-eighths of an inch. We tried returning the flap to 0, then adding incidence—although flight time increased over our first flights, it did not approach even closely to the highest flights.

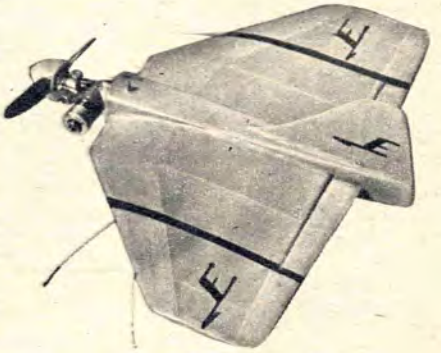
These flights were not intended to be a final conclusion but are the start of a lot of research which we intend to do this winter; next in line will be towhooks to be adjusted over a wide range, then canards; we have already built solid balsa wings. In short, if there are any secrets to Nordic design we intend to find out what these are.

Another interesting phenomenon we observed at the lake on Saturday was a "Perfidio" from AT plans built by Bill Tharp from San Francisco. Bill always flew this hand launched and its initial flight pattern was one of the weirdest we have ever seen. He would launch it in a right bank, the model would then whip over to the left in a 60 deg. bank, barely missing the ground with the left wing tip, then climb rapidly upstairs and float on for a six-minute flight; after turning in two sixes in a row it didn't miss the ground on its third launch. We suspect that warps necessitated the left thrust he added and that they would not take over till flight speed was reached.

When the guys started to arrive by large numbers the wind also came. It was getting dark, so it didn't matter much at that time. The cars parked rather close and directly downwind; tent city started going up. All around the place Coleman stoves provided the cooking heat, Coleman lanterns the light. With one exception, those guys from Santa Barbara—they had brought along a small charcoal broiler. The way Stan Hill and Glenn Miller cooked those home-fried potatoes and broiled those steaks—everyone's mouth was watering.

The wind continued on till 10:30 p.m., then it got calm, real calm, and the guys started flying. A pencell box with soldered flashlight bulbs was standard equipment. The best trick, though, was flashlights in PAA-Load models with the light shining through. The flying was for the most part excellent, times fairly high as a whole, and for the winner really high. Toshi Matsudo totaled over 13 minutes for three flights at midnight; the last flights were made at 3:15 a.m.!

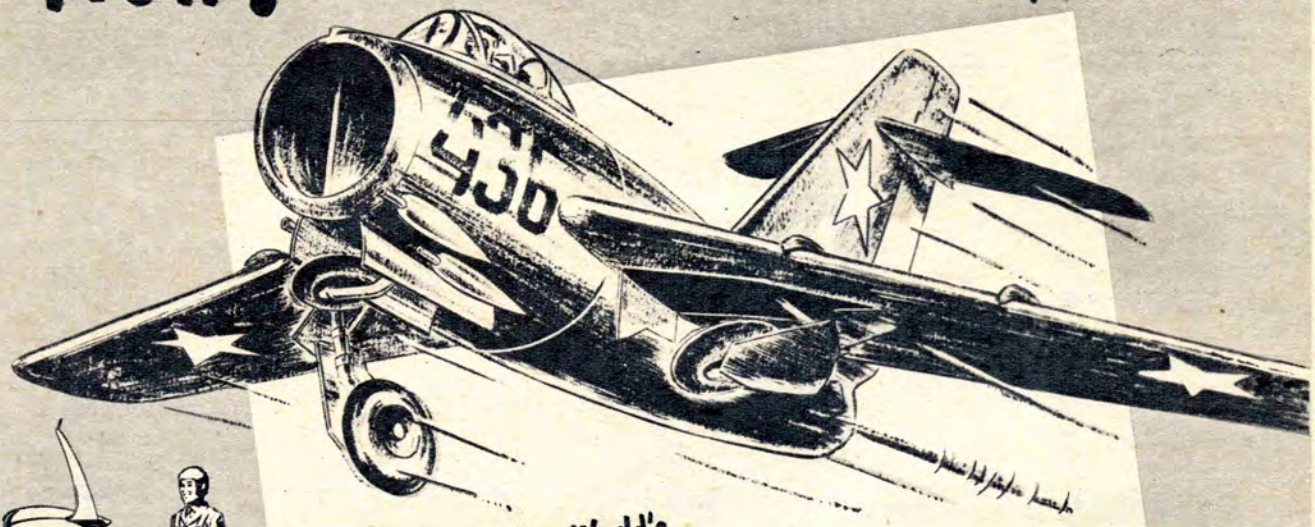
Some lights (*Continued on page* 15)



Another delta by Dick Everett, this one an Atwood-powered Half-A; has trimmed conventional speedsters having much less area.

New!

MiG-15 ★ Russian Jet Fighter!
It's a New One, Fellows!



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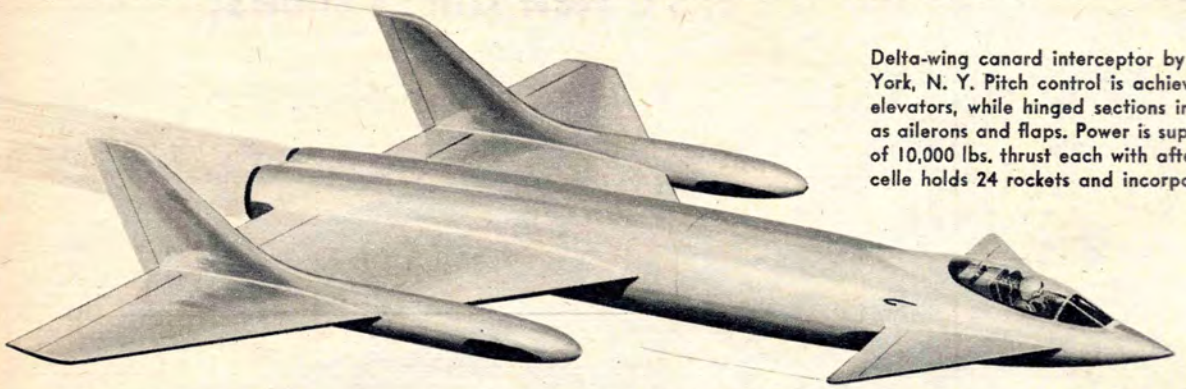
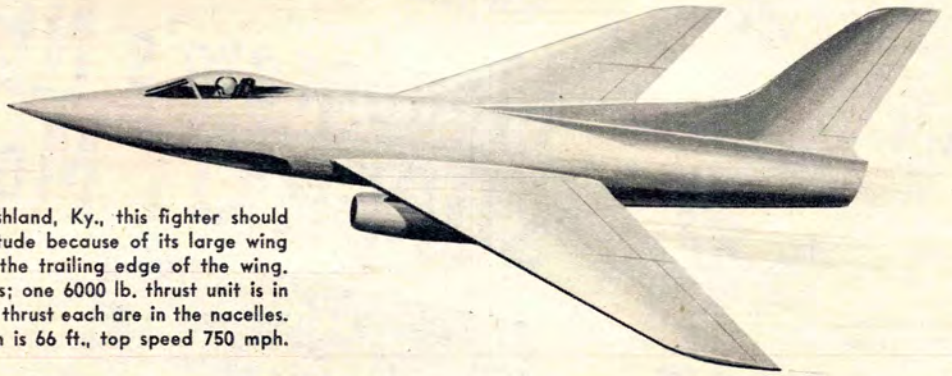
1ST AWARD
Canard Fighter-Interceptor



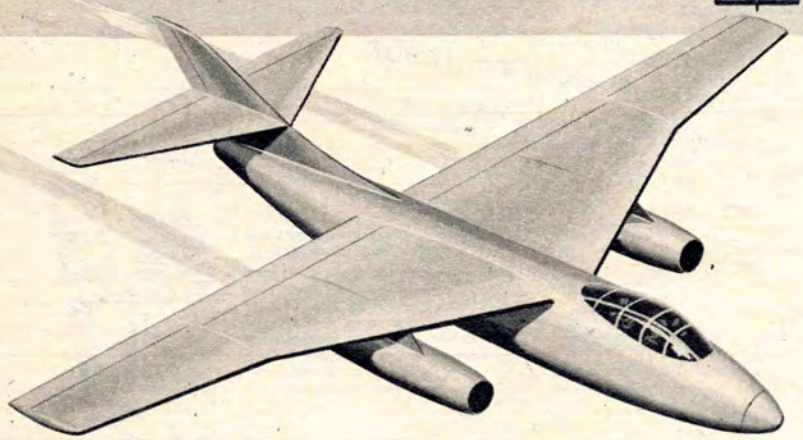
Delta-wing canard interceptor by Franchot Smith of New York, N. Y. Pitch control is achieved by forward-mounted elevators, while hinged sections in wing trailing edge act as ailerons and flaps. Power is supplied by two jet engines of 10,000 lbs. thrust each with afterburners. Each wing nacelle holds 24 rockets and incorporates interceptor radar.

2ND AWARD
High-Altitude Jet Fighter



Submitted by Jimmy Edwards of Ashland, Ky., this fighter should show good performance at high altitude because of its large wing area. Elevators are incorporated in the trailing edge of the wing. Plane is powered by three jet engines; one 6000 lb. thrust unit is in the fuselage and two jets of 1000 lbs. thrust each are in the nacelles. Armament: four 20-mm cannon. Span is 66 ft., top speed 750 mph.

3RD AWARD
Crescent Wing Atomic Bomber



Twin-jet bomber capable of carrying atomic bombs by Leo Navor of San Bernardino, Calif. The wing shape follows the crescent type with 36° sweepback of the main wing and 12° at tips. Plane has bicycle type landing gear which retracts into the fuselage with two outrigger wheels at wingtips. Engines develop 10,000 lbs. of thrust each. The armament consists of four 30-mm cannon in nose, and atom bomb in bomb bay. Pressurized cockpit, crew of 2, 760 mph.

AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½x11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payment of $5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.

(*Continued from page 12*)

went out and a merry search was made by headlights, some ships crashed and literally exploded, and man, it was *cold*. The desert might get hot in the summer, but those fall nights are downright chilly. Sleeping bags and blankets however, kept out most of the cold, even though ice was found in the morning. Some of the less hardy individuals or the really smart guys, don't know which, spent the night in motels.

Seems like the night flying no sooner stopped than day flying began; the sun didn't even get a chance to get up in the east when they started flying at dawn. We waited for breakfast. Food first for us! Some dudes even had trailers to cook out of. Mr. and Mrs. Clyde Austin, of timer fame, were the envy of everyone, tent and all, two-burner stove—they didn't play fair, made coffee and cooked at the same time.

When most of the cooking had finished there were close to a hundred and fifty cars and two full-scale aircraft in attendance. U-control circles, free flighters, R/C jobs, hand launch glider, plenty of room for everyone, fly anything you like.

The day was perfect, hardly any chasing, no thermals for over five hours, good air most of the time. By nine o'clock Sal Taibi and Denny Davis had over 14 minutes, other guys hit 4 plus, lots of 3 plusses. Plenty of flying for those 45 trophies and that extra engine loot. The thermals just weren't there till after 12 o'clock, with the result that most guys who had their three good ones in, placed high. Some contest!

The Thunderbugs ran the PAA-Load meet this year for the Los Angeles area and man, were they stymied—it turned out to be an obstacle contest. Vessels Ranch where we usually fly is being torn up and a new race track laid down, asphalt parking lot, two large ponds, each with 18 inches of water. Mr. Vessels says we can continue to fly there. Seems like this far-sighted gentleman thinks this hobby of ours is mighty good, even gets around to watch most of these contests for a little while. Vessels almost makes us forget those others who think us a bunch of destructionists, and his kind-heartedness pays off; sure is good to see model builders cleaning up the field after a flying session.

The contest was purty good if you got off and over any of the few small hills which were directly upwind. Several ships didn't quite make it. We had trouble with the rolling roof-paper runway, which didn't bother a lot of guys. Ray Van De Walker used that ageless A-B job for the first 3-six we have heard of, but we feel that he cheated just a little, having recovered the wing, silk this time, put poly in it too, recovered the fuse, then on his fourth flight became a member of the club, 3-six, fourth flub club, we mean, even became president with a sizzling 47 seconds. We suspect that Ray didn't take quite as much time as he should have when assembling his crate for that fourth flub.

Ronnie St. Jean was another guy who didn't have too much trouble winning Half-A. Lew Mahiew also got away fine. Amazing, though, was the luck of Jack Oxley and Harry Gould; they just couldn't get into any thermals. Conditions being what they were, it was a good contest—everyone flew under the same conditions.

Bakersfield! Wot a day! When going over the "Grapevine" we noticed quite a breeze blowing, but soon got out of it when we reached the valley, so didn't pay much attention to it. The contest site was sure nice and calm, good flights all over the place. No real thermals—lots of good air. Taibi totaled over 13 minutes, Denny did 4:30 on his first, then it happened—a dust storm hit. The guys that were up had their planes quickly blown out of sight, some of them never found them, others searched for an hour before succeeding.

A new club held its first annual meet, the Modeleers. Don Thompson is president, though we suspect that Forrest "Buster" Allen does his share of the work. The Modeleers were ably assisted by the La Ballona Valley Jr. Chamber, in fact,

(*Continued on page 63*)

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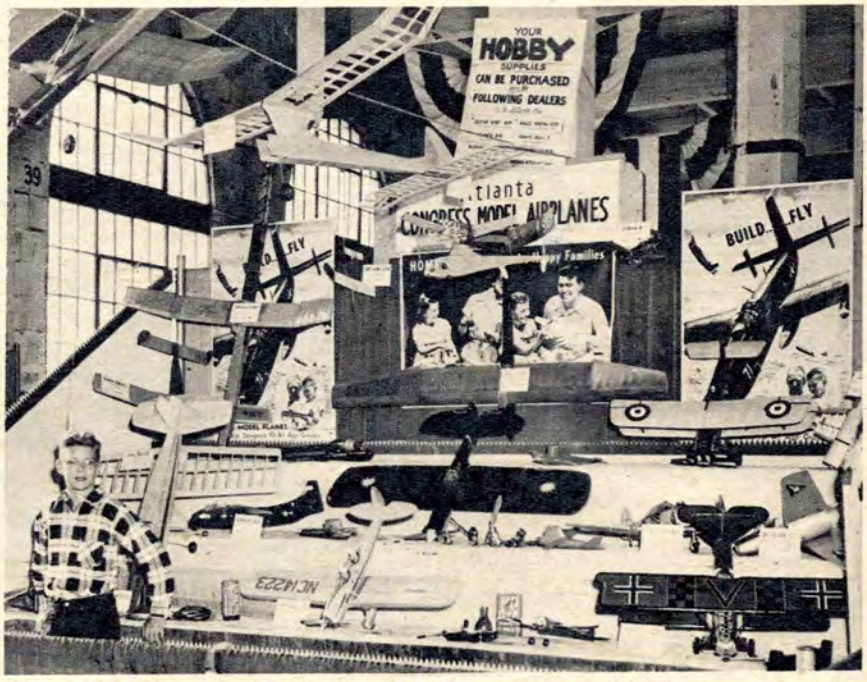

Atlanta's big, widely attended Fair-A-Ganza really became aware of model planes through this excellent booth. Richard Boozer, 14, Decatur MAC, shown in charge; photo by Tom Aldred

Southern Scene

Control line payload mark raised to 15 lbs. total wt. in Alabama record flight

■ It is fitting that we take one last long look at 1953 before we think of plans for the current year, because 1953 was the greatest year in the South for model airplane activities. For the first time, the Air Force Nationals came south to Maxwell Field in Montgomery, Ala. Bigger entry lists were in evidence in contests held in Alexander City, Ala.; Birmingham, Ala.; Nashville, Tenn.; Albany and Atlanta, Ga.; Charleston, Greenville, Spartanburg, and Columbia, S. C.; Tampa, Clearwater, Miami, West Palm Beach, and other points in Florida.

A record-breaking number of flyers from this area attended the Nationals at Willow Grove. Forty flyers from Ga., Ala., Tenn., S. C., Fla., and Mississippi competed. They won 58 places and 16 national titles. Georgia was close behind California, Ohio, and Pennsylvania in number of titles won. Several records were set by contestants from this area. The coveted Jim Walker Highest Stunt Score Perpetual came South for the first time. A South Carolina free flighter carried back the Arthur Godfrey Perpetual to his state from the Southeasterns.

For the first time, the 15th Annual Greater Southeasterns attracted the interest and support of Jim Walker, who put up 32 $50 Savings Bonds for first-place winners. It also interested Charlie Miller from Duro-Matic who contributed 32 McCoy .29's to the prize list. There were others of national importance who recognized this big meet for the first time.

1953 marked the beginning of a new event in model circles—"Radio Control Race"—conceived by Jim Walker who put up a stunning 36-inch perpetual. The event was highly interesting and bids fair to become a national one. Veteran Ed Stone of Jacksonville, Fla., was the first year's winner.

Another high point was the selection of George Perryman of Georgia as a member of the U. S. Team competing in the International Towline Glider Contest in Yugoslavia. Walter Pyron, a sensational junior from Georgia, won three national titles and set two new speed records. Carle Ray of nearby Smyrna, Ga., also won three national titles. Tommy Davis, Atlanta flyer, took first in D speed in Detroit. The U. S. Navy opened its arms to Model Airplane activities in this section with solid support of the Greater Southeasterns. It is expected that with their co-operation and leadership in 1954 an even bigger meet may be expected. Designs of several Southern flyers have been given national publicity. "Southern Scene" is the first column about happenings in the Southeast.

Our good neighbors in the Southwest put us on notice that Texas promises some of the nation's finest meets in the future, as the Southwest Regionals got off to a flying start in 1953 with some real classy speed records! Interest, long dormant, has been aroused in Mississippi with Ed Breland of Laurel as the sparkplug.

Incorporation of the Southeastern Federation marked a forward step in unifying and standardizing meets in District 5. Exhibitions for "March of Dimes" and other charities were flown, exhibits at Fairs, demonstrations in connection with Eastern Air Lines "Span of Flight" brought model flying before thousands of people in a most favorable light. During 1953 we observed the increase in flying by freshmen and junior ages, in itself a tribute to the co-operation of older flyers. The idea of "Father and Son" events conceived by Dave Dennis of Valdosta bids fair to become popular in 1954 contests. It was the best year in the history of our section.

Jack McCann of Montgomery, Ala., just missed last month's deadline and rates our first story. Jack relates that he read in Western Roundup of a U-control in PAA Load that hoisted 3 pounds 15 ounces, and tops it with this account:

"We had a (*Continued on page* 68)

Build that stunt job NOW!

$5.95

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Widely recognized as one of the nations top stunt models, the Guillow Barnstormer has emerged the winner of many state and local contests as well as heading the field at the '50 and '51 Nationals.

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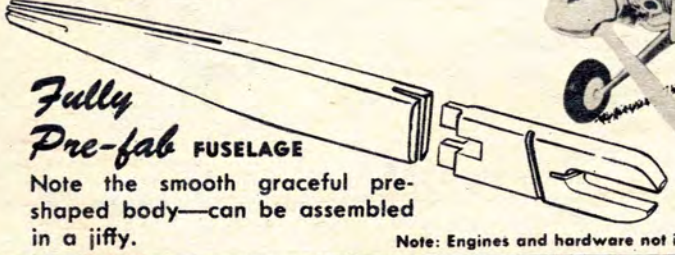

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X-3

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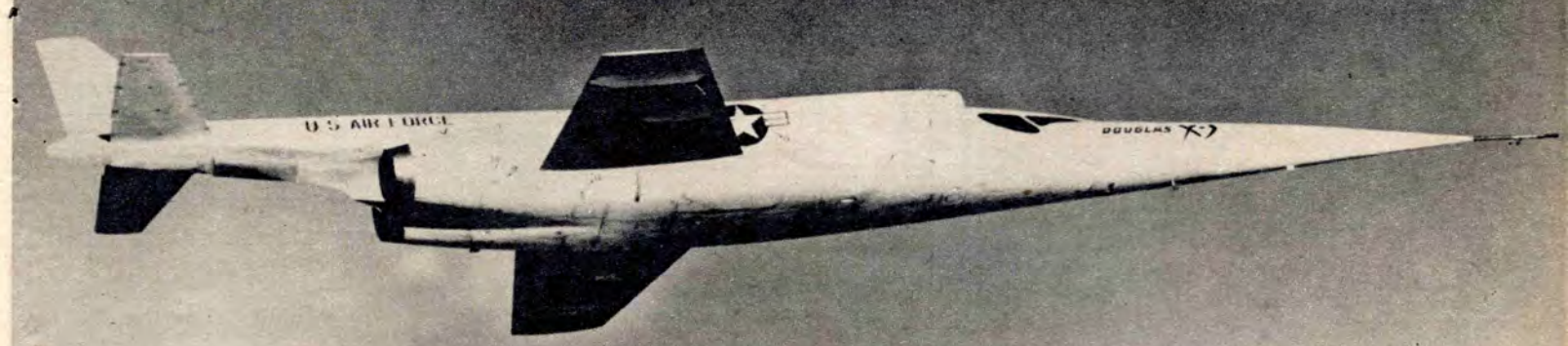
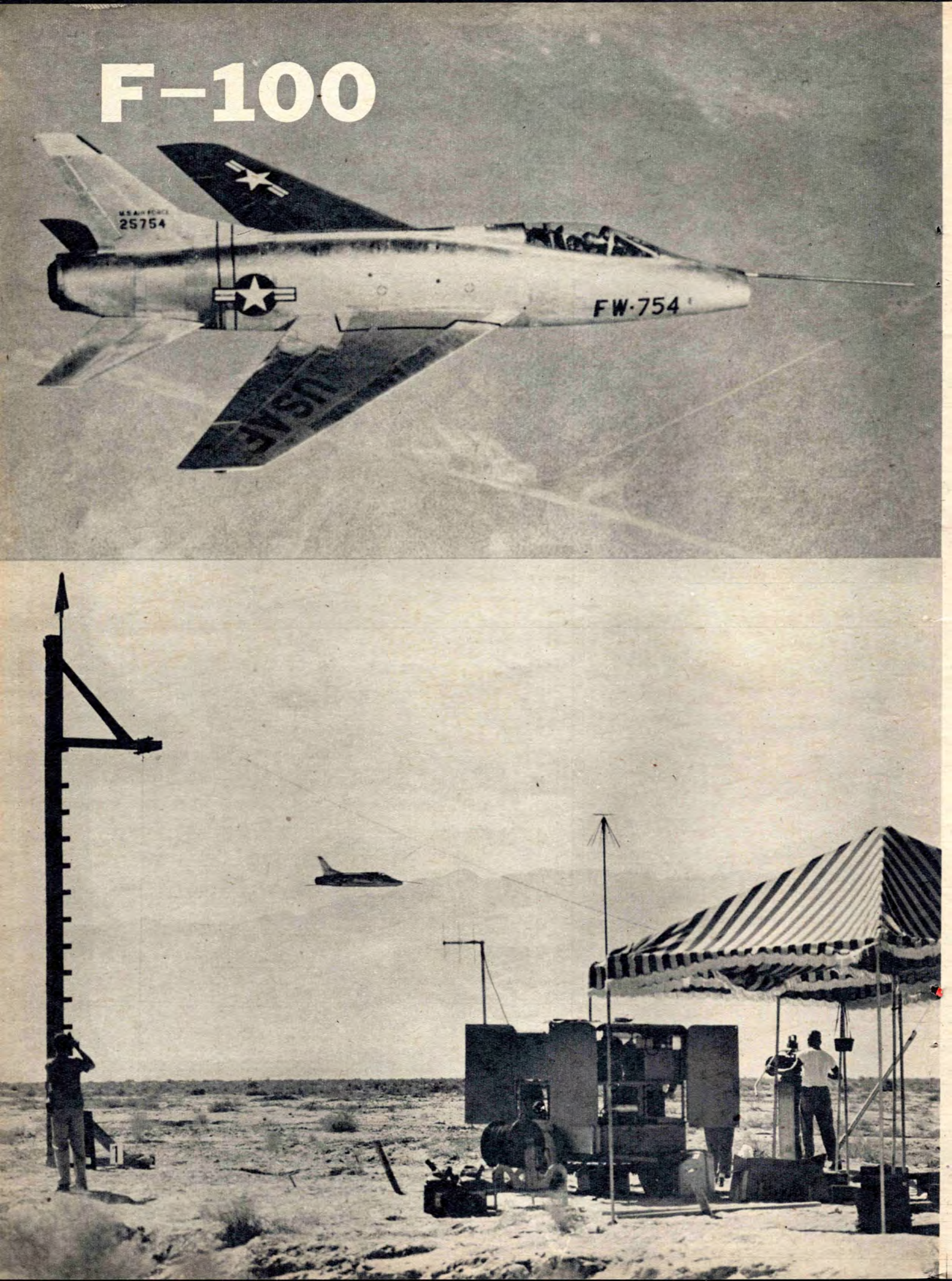


A weird shape has been appearing high above the Air Force testing grounds at Muroc resembling a spike with tiny wings. This is Douglas Aircraft Company's latest high-speed research plane, designed and built to fly better than 2000 mph at extreme altitude where the cold will keep down the blistering heat caused by its own motion through the air. The X-3, with the exception of its 22 ft. 8 in. wing, is not a small airplane. The fuselage, measuring 66 ft. 9 in., is longer than that of the DC-3 and its gross weight of 27,000 lbs. exceeds the DC-3 by 2000 lbs. Unlike its predecessor the Skyrocket, the X-3 takes off from the ground, requiring a run of close to 3 miles. It is powered by two Westinghouse J-34s with afterburners, which give it a total thrust of around 10,000 lbs.

F-100



To North American Aviation, Inc., in Los Angeles go the honors of producing the one hundredth type of Air Force fighter. What is most significant, this F-100 Super Sabre is also the first fighter capable of flying at sonic speed in level flight. Based in essentials on the F-86 Sabre, the F-100 is a much larger and heavier airplane with greater angle of sweepback in its thin, razor-edge wing, better streamlined fuselage and cockpit canopy. Contrary to practice in high-speed airplanes, the horizontal tail is set low, its surface is all-movable, not divided as on conventional airplane into elevator and stabilizer. This gives the F-100 superior stability characteristics in the critical transonic range. The Super Sabre is powered by a Pratt & Whitney J-57 jet engine with an afterburner which gives it well over 10,000 lbs. of thrust. Naturally, such a fast, heavy airplane has a fairly high landing speed; in order to shorten its roll on the ground it is equipped with a drag chute. On October 29, 1953, the F-100 established a new world speed record for the 15 km (9 miles) course at Salton Sea, Calif., averaging 754.9 mph, with the fastest run clocked at 767.27 mph.

PERFORMANCE AND SPECIFICATION DATA ON F-100 SUPER SABRE

Dimensions
Span: 36'
Length over-all: 45'
Height over-all: 14'

Wings
Swept back 45 degrees
Spar—aluminum alloy
Ribs—aluminum alloy
Covering—alum. alloy tapered

Landing Gear
Type: tricycle retractable

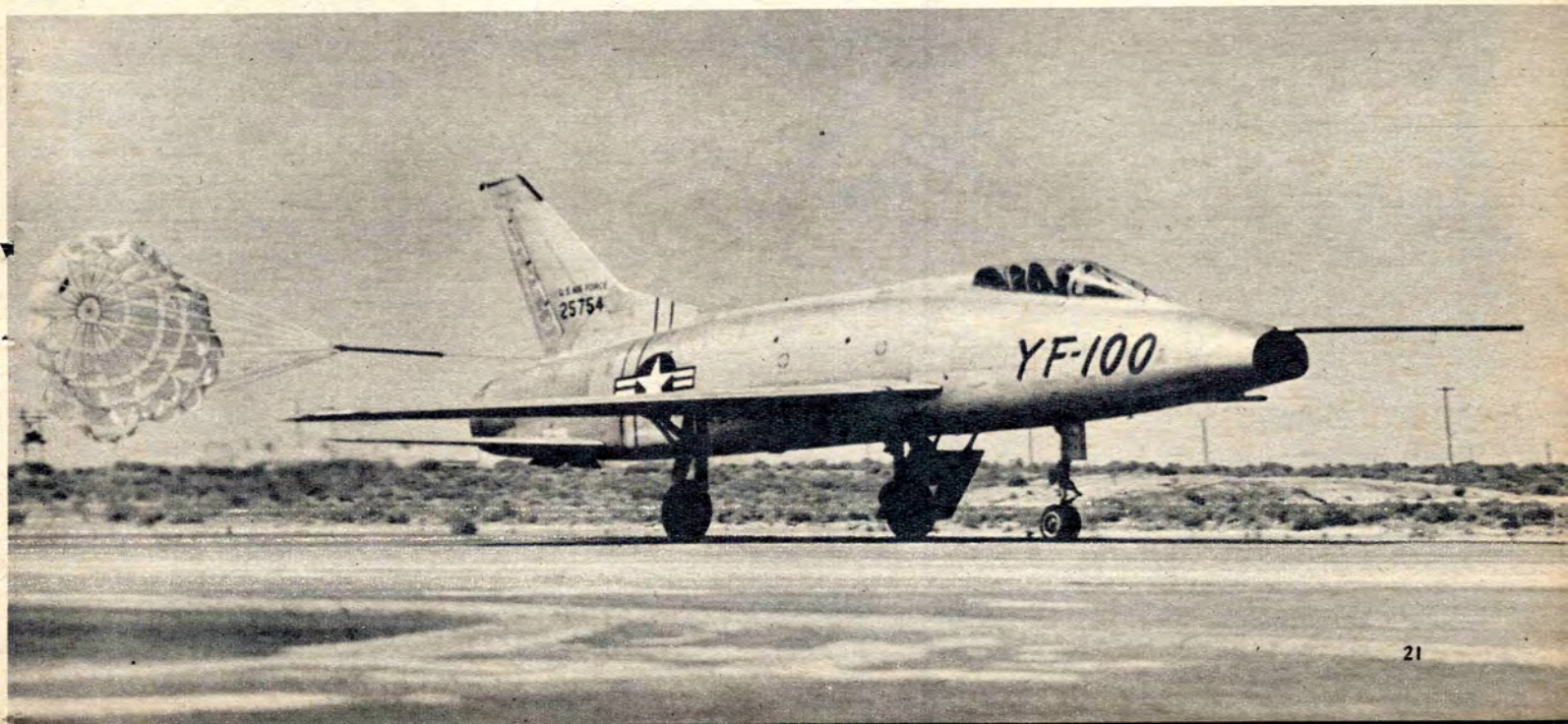
First Flight Date
YF-100—May 25, 1953

Mission
Air superiority fighter designed for max. climb, maneuverability, altitude, and high speed

Powerplant
Make of engine: P&W J57-P7

Performance
Speed: supersonic
Combat radius: 500+ naut. mi.
Maximum service ceiling: over 50,000 ft.

Crew: Pilot



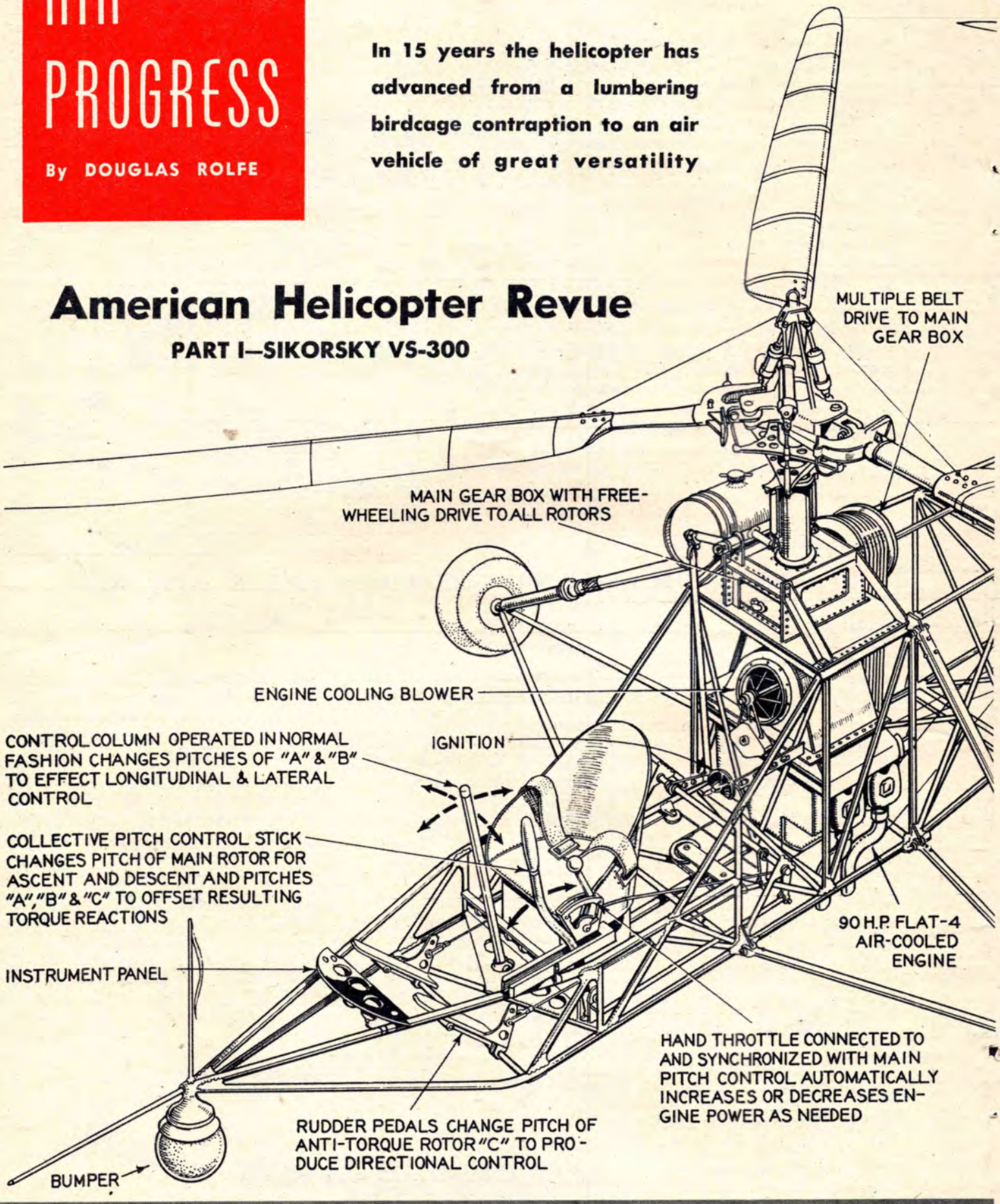
AIR PROGRESS

By DOUGLAS ROLFE

In 15 years the helicopter has advanced from a lumbering birdcage contraption to an air vehicle of great versatility

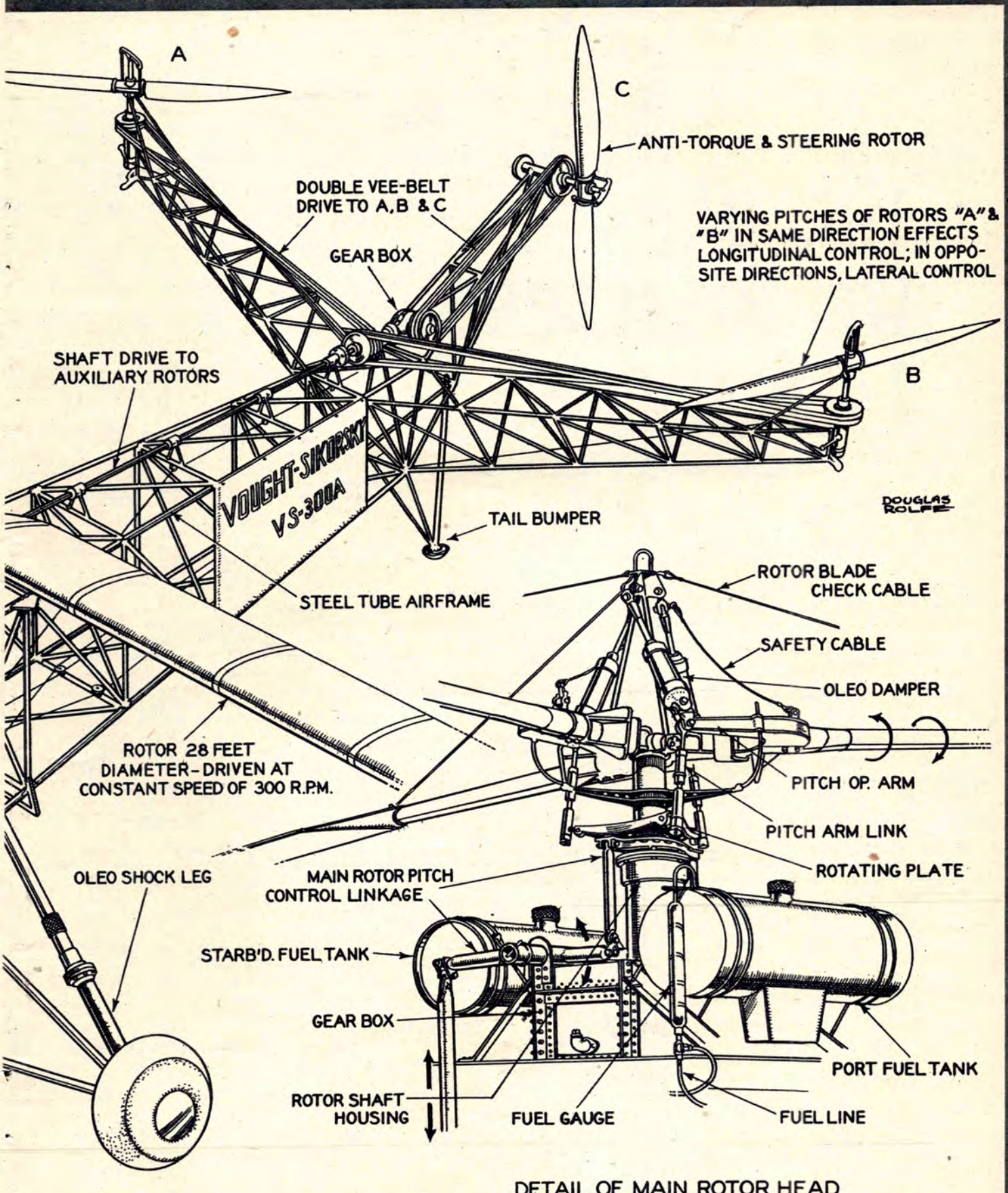
American Helicopter Revue

PART I—SIKORSKY VS-300


MULTIPLE BELT DRIVE TO MAIN GEAR BOX
MAIN GEAR BOX WITH FREE-WHEELING DRIVE TO ALL ROTORS
ENGINE COOLING BLOWER
IGNITION
CONTROL COLUMN OPERATED IN NORMAL FASHION CHANGES PITCHES OF "A" & "B" TO EFFECT LONGITUDINAL & LATERAL CONTROL
COLLECTIVE PITCH CONTROL STICK CHANGES PITCH OF MAIN ROTOR FOR ASCENT AND DESCENT AND PITCHES "A", "B" & "C" TO OFFSET RESULTING TORQUE REACTIONS
INSTRUMENT PANEL
90 H.P. FLAT-4 AIR-COOLED ENGINE
HAND THROTTLE CONNECTED TO AND SYNCHRONIZED WITH MAIN PITCH CONTROL AUTOMATICALLY INCREASES OR DECREASES ENGINE POWER AS NEEDED
RUDDER PEDALS CHANGE PITCH OF ANTI-TORQUE ROTOR "C" TO PRODUCE DIRECTIONAL CONTROL
BUMPER

The VS-300 made its first successful flight in 1939. The first airplane flew in 1903. But the development of the airplane in the fifteen years following the Wright brothers' great achievement does not compare with that of the helicopter in an equal period. A new form of powered flight was put into practical form with Sikorsky's craft that was also in the epoch-making league. Like the Wright biplane it was a crude open-frame machine. Like the Wright it had a cumbersome method of control when viewed from present-day standards and, also like the Wright, it took a lot of flying.

As will be seen from the detailed drawing the first Sikorskys (there were several modifications of the design) had



DETAIL OF MAIN ROTOR HEAD

one main rotor driven through belt and gear drive. This rotor provided the main lift and the pitch of the blades could be changed collectively only. Longitudinal and lateral control were provided by the two small laterally displaced tail rotors. Directional steering was effected through the anti-torque tail rotor. It was all very complicated but it worked. Forward flight was accomplished by tilting the machine down by means of the small lateral rotor which could also tilt the machine laterally for sideways flight. With the development of the cyclic pitch gear the laterally displaced rotors became redundant. However, Sikorsky's first practical helicopter had shown the way.

THE DAY WE MISPLACED ITALY

A WW II pilot recalls the fantastic results when his outfit met that hurricane-plus wind aloft now tagged "Jet Stream"

■ It doesn't matter much now, of course, but I'm glad to know at last what happened one February day back in 1943. If you weren't in Italy at the time you may not have heard about it, because this sort of thing rarely makes the papers. It was the day that, during a routine bombing mission, the Fifteenth Air Force disappeared.

It didn't disappear permanently, of course, but there was a while when things looked pretty black. At the estimated time of landing, not one plane out of the entire Fifteenth had even been heard from by radio, and for a full hour afterwards there was no contact. Rumor later had it that General Twining, after considerable chewing on his pencil stub, composed a message which he was all ready to send when the first plane was eventually heard from. The message: "Dear President Roosevelt, please send me another air force, I lost the one I had."

I am reminded of all this now as a result of having read recently about a meteorological phenomenon called the "jet stream"—a high-altitude, rather narrow band of wind blowing from west to east at velocities up to a hundred and fifty miles an hour. This lofty, continuous gale, which presumably travels right around the earth over the Northern (and Southern, I suppose) Temperate Zones, has an undulating motion which causes it to vary considerably in latitude from day to day. Back in 1943, occasional sketchy references were made to "winds aloft," but there was no great knowledge of their real nature.

At that time, I was a fighter pilot in the 325th Fighter Group. On the day referred to we flew penetration escort on a heavy bombing mission. As I recall, two other fighter groups were doing the same job, which was to guard some five hundred heavy bombers from enemy fighter attack on the route to the target. Other fighters were to pick them up there and escort them home. The target was the downtown section of Sofia, 420 miles almost due east of our base.

The flight started out ordinarily enough. The weather, as had been predicted, was superb. We left base around the middle of the morning and climbed slowly on course over the Adriatic. Hitting the Yugoslavian coast, we were only slightly dismayed to find that a solid blanket of clouds extended under us from the sea to the eastern horizon. At this point we had about 18,000 feet of altitude under our wings and were still climbing.

About a half hour later we picked up the bombers and began our lazy, weaving coverage, some 3,000 feet above our assigned group—and there we stayed for the next hour or so, all still slowly climbing until we got to about 27,000 feet. We had not had a glimpse of the ground during the entire time since we left the coast of Yugoslavia. Target time arrived, and we, in the fighters, began to wonder what the bombers flying so complacently along intended to do. Our fighters were all P-47 Thunderbolts, single-engine jobs having great weight and huge appetite for gasoline—and it was easy to tell when going-home time came around by the increasing sloppiness of our formation.

And then we saw it all together; at least I *suppose* the rest of them saw it. Through a break in the clouds appeared a great river, and in the middle of that river was a distinctively shaped island. It took me only five seconds to find it on the map. That island was in the Danube, about 125 miles to the northeast—which is to say, *beyond* Sofia. Four hundred and twenty miles to Sofia plus 125 miles to the island . . . we were 550 miles from base! And the combat radius of a P-47, they kept telling us, was *four* hundred and fifty miles.

I didn't bother to find out what the rest of them intended to do. I hollered to my flight and turned around instantly, hauled the rpm lever back to 1900 revs to save gas, and headed for home. When I last saw them, the bombers were still sailing serenely off toward the east. Great. The devil with them. All those navigators. All that fancy radio equipment. All that intensive training with the computors and the direction finders and the sextants. All that talk about pinpoint precision bombing. The devil with them all. *Let them go to Baku—me, I'm going home.*

I looked at my operations data, which had been computed and written down before take-off: One hour and twenty minutes from target back to base. I added another twenty-five minutes for the extra mileage and quit thinking. Thinking is fine when it does some good. At other times the only thing that does any good is waiting. This was

By PAUL JENSEN

strictly no-think waiting time coming up.

Underneath still lay solid clouds. Back at base the fellows were collecting around the revetments. In Sofia, citizens were probably shopping. Overhead it was fine—some streaks of cirrus and a bright noonday sun, and a deep blue sky, and a little sliver of moon. Yes, and Jupiter. Good old Jupiter at high noon. Nothing like it to make a man feel foolish and alone five miles up in the air with no ground in sight.

An hour went by, with every now and then a glimpse of a mountain through the clouds to show me that Bulgaria and Yugoslavia were still present. An hour and a quarter—more mountains peeping through. That was funny. I had figured by this time I should jolly well be over the Adriatic. An hour and forty minutes. More mountains! Still over Yugoslavia! *That's downright silly, I should've left Yugoslavia a half hour ago.* But then maybe I *had* already. Maybe I had flown right across the Adriatic without even knowing it—and was over Italy! I got on the radio and called the homing station. "Big Fence, this is Inkwell 57. Do you read me?" No answer. "Hey, Big Fence, give me a short call!" No answer.

I had an awful feeling for a moment that they had packed up their war and gone home—or that maybe I had gone bats. Nothing added up properly. Sure, time multiplied by speed equals distance, but here I had a situation in which, no matter how often I tried, the answer came out all wrong.

Fifteen minutes more. I suppose it was about then the general put tooth to pencil. And abruptly through a break in the clouds I saw a coast line with water ahead. But whose coast line? It occurred to me that I might have flown right over Italy and was headed out over the Mediterranean for Gibraltar. One thing was for sure. If I dropped down through a hole and took time to learn whose country it was and discovered it really was Yugoslavia, I certainly would never make it across to Italy. Only one thing to do: go on and hope and sweat it out.

Cruising at high altitude, it ordinarily took about twenty-five minutes to cross the Adriatic. I didn't even get radio contact until I had been out for fifteen. And when the radio did open up it was pure bedlam. Hundreds of frantic pilots all calling for homings at once—punctuated every now and then with desperate "Mayday" calls for help.

I switched back to the channel which was common to the fighter groups just in time to get in on a fascinating conversation.

Fellow says, "My gas gauge says empty." Other fellow says, "Boy, how it say empty when you still have seventy-five miles to go?" First man answers back, "I don't know, man, unless there's something wr. . . . My engine just quit!" And the second voice says, "Then best yo' get out of that airplane and get into yo' *in*-flatable ding-high." End of conversation.

After a total of forty nervous minutes over the water, Italy showed up right where it should have been, and probably was, all that time.

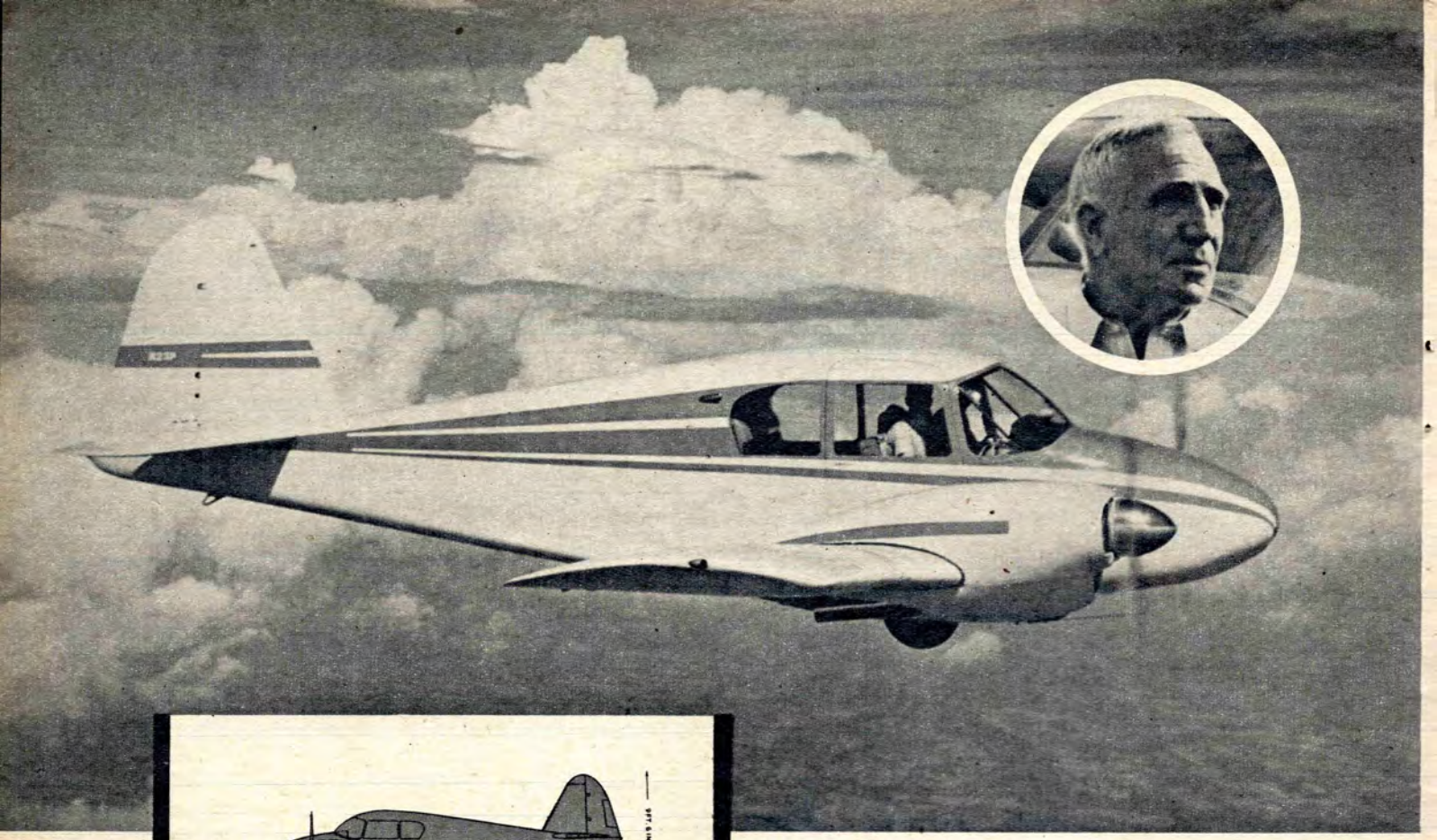
I landed with the least possible ceremony, along with two of my flight. (Number four had left a while back. I later found out he had landed all right at Bari.) As I was taxiing off the runway, I ran out of gas.

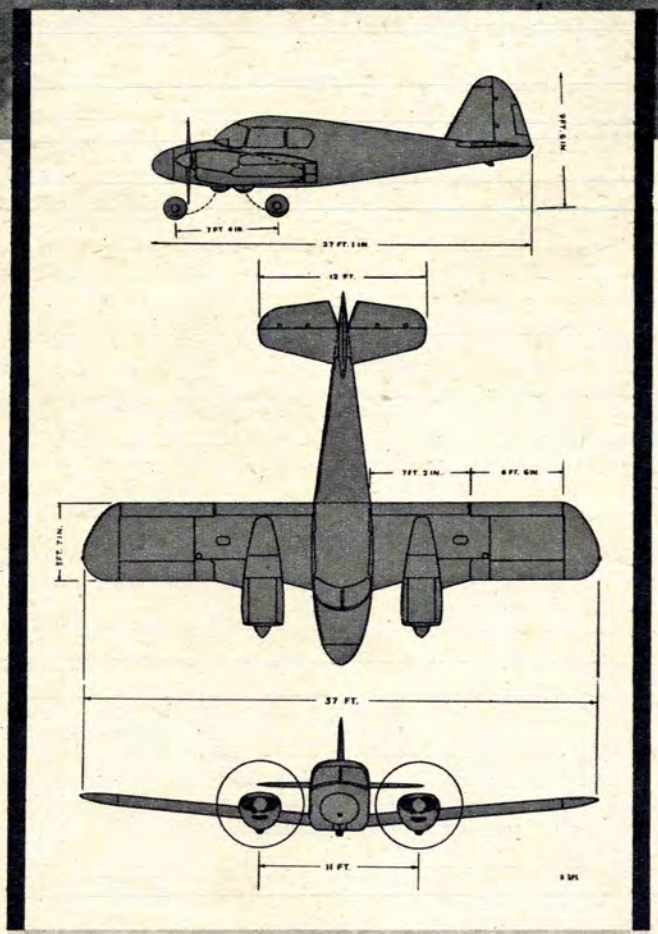
The Fifteenth Air Force lost about ten bombers that day, some on the beach, some in water and some in Yugoslavia. There had been no flak and no enemy fighters. All had run out of gas. The man who commanded the bombers we had followed was a lieutenant colonel when he took off and a lieutenant period when he landed. The fighters fared a little better than the bombers—perhaps simply because it is easier in a small plane to turn around and git for home when the time comes. I don't know how many ships the other groups lost; we lost only one. Reynolds, who always claimed that his engine ran smoother at high rpm's, ran out of gas and belly-landed on the beach. The Sofians went about their shopping undisturbed.

During the day—too late to do us any good—they discovered that the wind above 20,000 feet was blowing due east at around 120 miles an hour. This, of course, explains the whole fiasco. Nobody had ever heard of the jet stream at that time, and so nobody was prepared for it. Today, I understand that they are more careful.

ABOUT THE AUTHOR

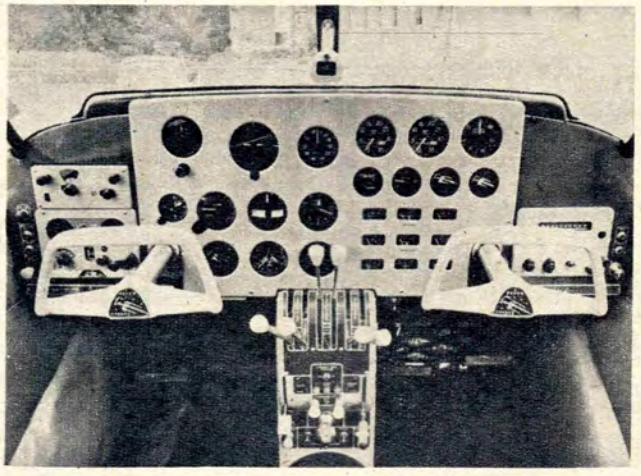
Ex-AAF gunnery expert; now associate editor with one of America's largest book publishers; author of "Golden Book of Airplanes"; edited the very fine collection "Fireside Book of Flying Stories." One-time professional art restorer—his greatest feat was putting sizable patch on a Goya; in Italy for four months he owned an Fw-190! Married, 37, 2 children.





Pappy Piper's New Apache

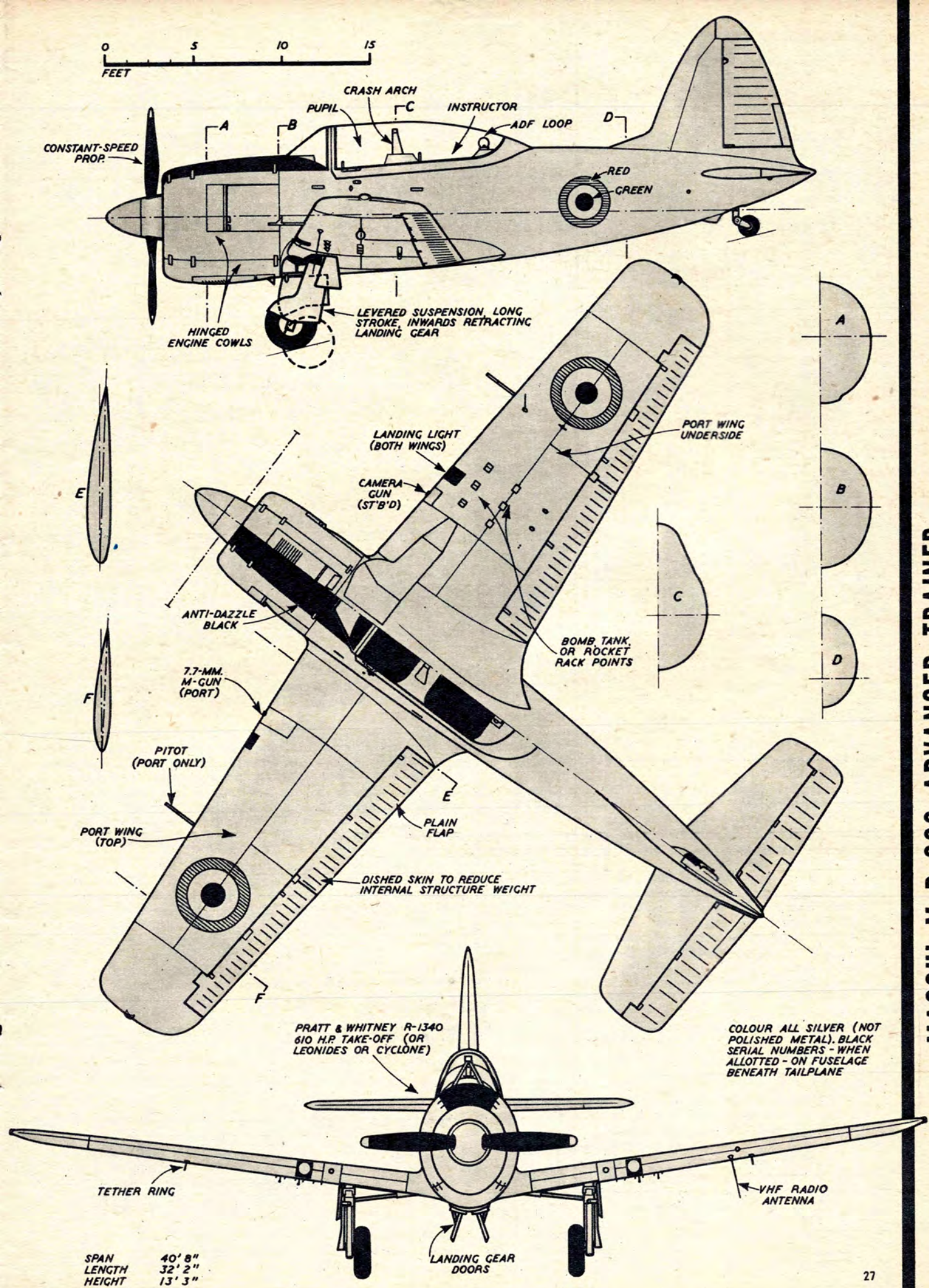
A light twin-engine four-passenger airplane with low price tag for executive use has long been needed. Piper solved this demand neatly with the new Apache whose simplicity and ability to fly on one engine make it safe, economical transportation.



Above: Apache's front office is neat and orderly with all essential instruments for blind flying. Left: Front view of Apache showing the well-cowled 150 hp Lycoming engines and full-feathering, constant-speed Hartzell props. Cruises: 160 mph; price: around $30,000.

MACCHI M.B.323 ADVANCED TRAINER

DRAWN BY ROY CROSS



SPAN	40' 8"
LENGTH	32' 2"
HEIGHT	13' 3"
LOADED WEIGHT	4950 LB.

Mitsubishi Zero

Most famous fighter of early Pacific warfare was the Jap Zeke

By WALTER A. MUSCIANO

■ One of the biggest surprises of World War II was the fact that the Jap Zero fighter could outclimb and outmaneuver the best of Allied fighters during the months immediately following Pearl Harbor. These clean-looking craft held their own against some of the best U.S. planes for a longer period than the American flying forces like to remember.

Much confusion existed as to the actual identity of the real Zero. At one time, during 1942, as many as three Japanese planes were called "Zero." The Mitsubishi S-OO Mark I turned out to be the real, vaunted enemy fighter. This craft was called "Zeke" and is listed as such on all identification charts. A virtual twin, Hamp, was also called the Zero. Plans for both planes are shown.

Power was a 1,200 hp Mitsubishi Kinsei, twin-row, air-cooled, radial engine which pulled the craft to a top speed of 345 mph. Range was 1,600 miles with the aid of an auxiliary detachable tank. This tank, incidentally, was made of papier maché and plywood as a material conservation measure. A 500 lb. bomb could be substituted for it. Armament consisted of two 7.7-mm machine guns in the upper cowl and two 20-mm cannon mounted in the wing.

The "Achilles Heel" of the Zero was the fragile egg-shell construction that was necessary to obtain a light wing loading for its excellent maneuvering qualities. For this reason, the craft could not outslug its adversaries but relied on its climbing ability and maneuverability to utilize hit and run tactics.

Our control line replica of this famous plane is built to the scale of ¾" = 1'-0" and will accommodate engines from .14 to .33 cubic inch displacement. A Veco .29 engine powers the prototype model. However, alternate engine installations are illustrated including upright and pancake mountings.

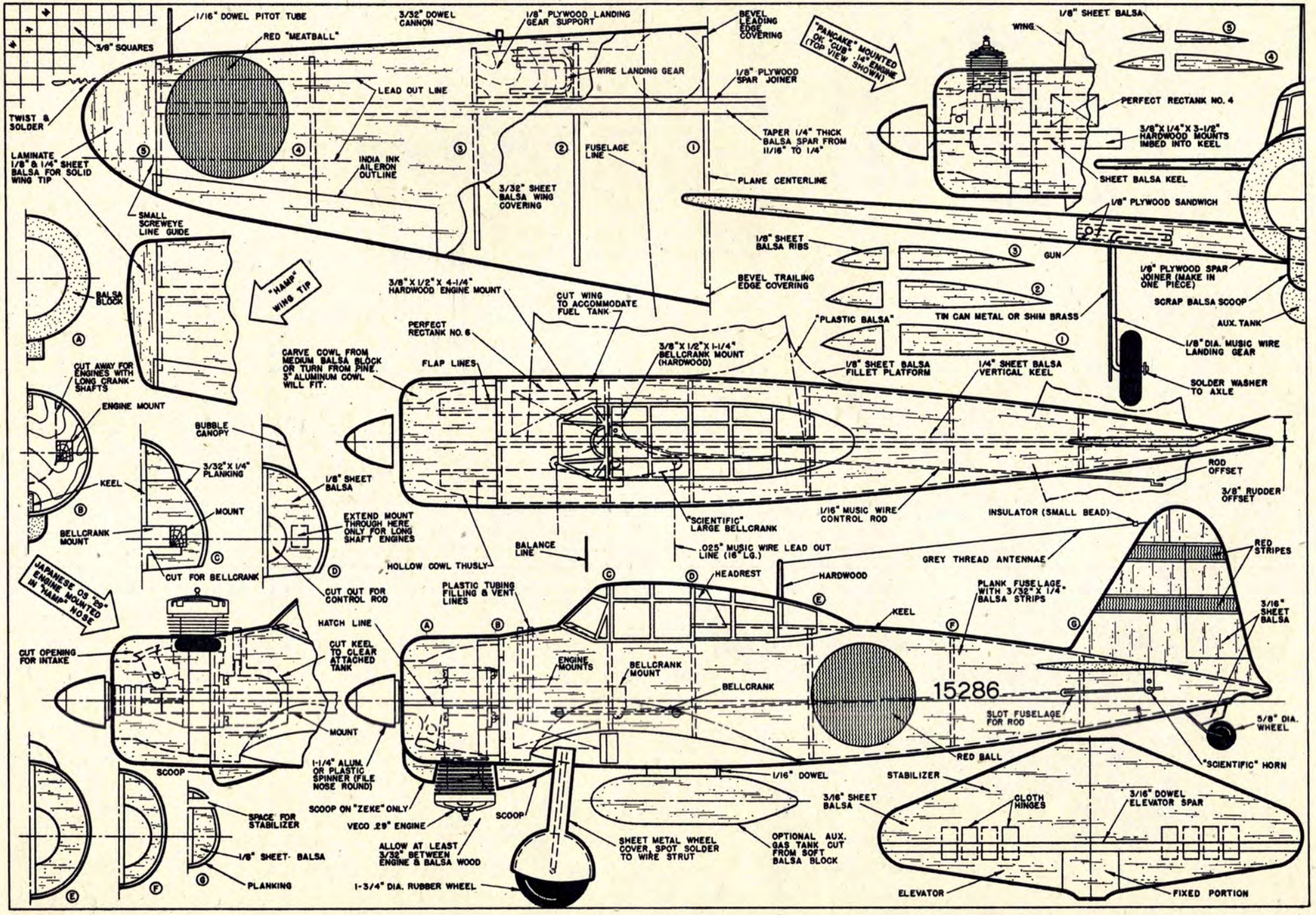
Construction is started by cutting the vertical keel to shape. Be certain to cut out for the wing and stabilizer as well as bellcrank mount. If a pancake engine installation is used, with a beam mount, spaces should be cut out of the keel for these mounts. Install the mounts now, if required. Cut the formers and plywood bulkhead to shape and cement to the keel. Note that the bulkhead should be cut out only to accommodate those engines with an attached tank. This bulkhead is normally left solid. Cement the bellcrank mount in place.

Attach the wire lead-out lines to the bellcrank and bolt the bellcrank to the mount. Be sure to twist and solder the ends of these lead-out lines as illustrated on the plans.

Cut the elevator and stabilizer to shape and sand smooth. Cement the elevator halves to the dowel spar and add the control horn. When thoroughly dry the elevator assembly is hinged to the stabilizer. Cloth hinges are used. Firmly cement the stabilizer into the slot in the keel and add the control rod.

Attention should now be directed to the wing. In order to attain the width required the wing covering must be butt-joined. When this joint is dry the sheet covering is cut to outline shape. Taper the balsa spars as described on the plan. Sand smooth and cement to the lower sheet covering. Saw the plywood spar joiner in one piece and firmly cement this to the balsa spars, thereby forming the correct dihedral automatically. The wing ribs are cut, sanded and then cemented to the spar and lower (*Continued on page* 70)

Captured Jap Mitsubishi fighter surprised U.S. pilots with its fine flight characteristics. See "Air Progress" 53/54 Issue for more data.


1/16" DOWEL PITOT TUBE
3/8" SQUARES
RED "MEATBALL"
3/32" DOWEL CANNON
1/8" PLYWOOD LANDING GEAR SUPPORT
BEVEL LEADING EDGE COVERING
WIRE LANDING GEAR
1/8" PLYWOOD SPAR JOINER
LEAD OUT LINE
TWIST & SOLDER
LAMINATE 1/8" & 1/4" SHEET BALSA FOR SOLID WING TIP
INDIA INK AILERON OUTLINE
FUSELAGE LINE
TAPER 1/4" THICK BALSA SPAR FROM 11/16" TO 1/4"
3/32" SHEET BALSA WING COVERING
PLANE CENTERLINE
SMALL SCREWEYE LINE GUIDE
BALSA BLOCK
"HAMP" WING TIP
3/8"X 1/2"X 4-1/4" HARDWOOD ENGINE MOUNT
CUT WING TO ACCOMMODATE FUEL TANK
BEVEL TRAILING EDGE COVERING
PERFECT RECTANK NO. 6
CARVE COWL FROM MEDIUM BALSA BLOCK OR TURN FROM PINE. 3" ALUMINUM COWL WILL FIT.
FLAP LINES
3/8"X 1/2"X 1-1/4" BELLCRANK MOUNT (HARDWOOD)
CUT AWAY FOR ENGINES WITH LONG CRANK-SHAFTS
ENGINE MOUNT
BUBBLE CANOPY
3/32"X 1/4" PLANKING
KEEL
1/8" SHEET BALSA
MOUNT
BELLCRANK MOUNT
EXTEND MOUNT THROUGH HERE ONLY FOR LONG SHAFT ENGINES
CUT FOR BELLCRANK
CUT OUT FOR CONTROL ROD
HOLLOW COWL THUSLY
BALANCE LINE
"SCIENTIFIC" LARGE BELLCRANK
1/16" MUSIC WIRE CONTROL ROD
.025" MUSIC WIRE LEAD OUT LINE (16" LG.)
JAPANESE O3 "29" ENGINE MOUNTED IN "HAMP" NOSE
PLASTIC TUBING FILLING & VENT LINES
HATCH LINE
CUT KEEL TO CLEAR ATTACHED TANK
CUT OPENING FOR INTAKE
ENGINE MOUNTS
BELLCRANK MOUNT
BELLCRANK
MOUNT
1-1/4" ALUM. OR PLASTIC SPINNER (FILE NOSE ROUND)
SCOOP
SCOOP ON "ZEKE" ONLY
VECO .29" ENGINE
ALLOW AT LEAST 3/32" BETWEEN ENGINE & BALSA WOOD
SCOOP
SPACE FOR STABILIZER
1/8" SHEET BALSA
PLANKING
1-3/4" DIA. RUBBER WHEEL
SHEET METAL WHEEL COVER, SPOT SOLDER TO WIRE STRUT
OPTIONAL AUX. GAS TANK CUT FROM SOFT BALSA BLOCK
1/16" DOWEL
3/16" SHEET BALSA
"PANCAKE" MOUNTED OR "CUB" .14" ENGINE (TOP VIEW SHOWN)
WING
1/8" SHEET BALSA
PERFECT RECTANK NO. 4
3/8"X 1/4"X 3-1/8" HARDWOOD MOUNTS IMBED INTO KEEL
SHEET BALSA KEEL
1/8" PLYWOOD SANDWICH
1/8" SHEET BALSA RIBS
GUN
1/8" PLYWOOD SPAR JOINER (MAKE IN ONE PIECE)
SCRAP BALSA SCOOP
TIN CAN METAL OR SHIM BRASS
"PLASTIC BALSA"
AUX. TANK
1/8" DIA. MUSIC WIRE LANDING GEAR
1/8" SHEET BALSA FILLET PLATFORM
1/4" SHEET BALSA VERTICAL KEEL
SOLDER WASHER TO AXLE
ROD OFFSET
3/8" RUDDER OFFSET
INSULATOR (SMALL BEAD)
GREY THREAD ANTENNAE
RED STRIPES
HEADREST
HARDWOOD
PLANK FUSELAGE WITH 3/32" X 1/4" BALSA STRIPS
KEEL
3/16" SHEET BALSA
15286
SLOT FUSELAGE FOR ROD
5/8" DIA. WHEEL
RED BALL
"SCIENTIFIC" HORN
STABILIZER
CLOTH HINGES
3/16" DOWEL ELEVATOR SPAR
ELEVATOR
FIXED PORTION

COLD Weather Flying

So it's zero! Is that any reason to stop flying? Not with Mound, Minn., fans

By JOHN BERRYMAN

Science fiction writer and air modeler Berryman bundled up for a flying session. First of all, he reports, you gotta be warm and comfortable. Non-fuel proof cotton gloves are an expendable item.

■ We can hear you asking, "Why *any* winter flying?"

First off, any flying is good flying. But in the Midwest, in particular, summer flying is not all that it might be. In our case, too, it conflicts seriously with fishing. In almost all cases in Minnesota, summer flying suffers badly from rather persistent high winds. The winter, with its reduced thermal activity, has many more good flying days than the summer.

Cold weather flying resolves itself into winter-conditioning the pilot, the model and accessories.

As for the first, the whole deal is no good if you are uncomfortable. You can see above what we think is a reasonable winter rig for Minnesota. The gloves are double, cotton fleece, rubber lined in between layers. They are reasonably cheap; better ones should not be used. Fuel will get them pretty messy soon enough, and you'll have to throw them away.

You can make cold weather starting easy if you do these things: 1. Provide a good flow of current to your glow plug. 2. Use a reactive fuel. 3. Provide additional heat to the motor during starting. 4. (Occasionally) keep cylinder head hot after starting. 5. Use a high-compression motor. 6. Keep the motor reasonably warm between flights.

Because batteries don't put it out when cold, we use three dry cells in parallel, get about ten amps at the glow plug. We put the cells in a wooden box to insulate them as much as possible from the cold and to keep them dry. We use heavy lead-out wire to keep amperage up. Most important, we keep the ammeter handy at all times, and never flip a prop unless we have tested current *and* glow plug.

As for fuels, all glow fuels on the market today are well-compounded and made from top ingredients. Some fuels are designed for one purpose, some for another. The one that we have found best for our brand of cold weather is Francisco Laboratories' "Infant Thimble Glow." It is apparently highly reactive, being designed for Half-A motors that radiate heat quickly, and at the same time is well lubricated, as witness its being specified for Dooling motors. We use it in piston-ring and lapped-piston motors alike, from high compressions such as Hornet and Dooling, to low compressions such as Fox. We have tried about five other top fuels. All can be made to work.

The most important of the six points mentioned is this one: Provide additional heat to the motor during starting. You may find at moderately cold temperatures that wrapping your fingers and palm around the head and fins for a minute or two will make a great difference in starting. Dooling .29, for instance, will start at zero when hand-heated; it tends to foul up if hand heat is not provided. But lower compression motors, and motors with less favorably placed glow plugs, need much more heat if they are to be started below freezing temperatures.

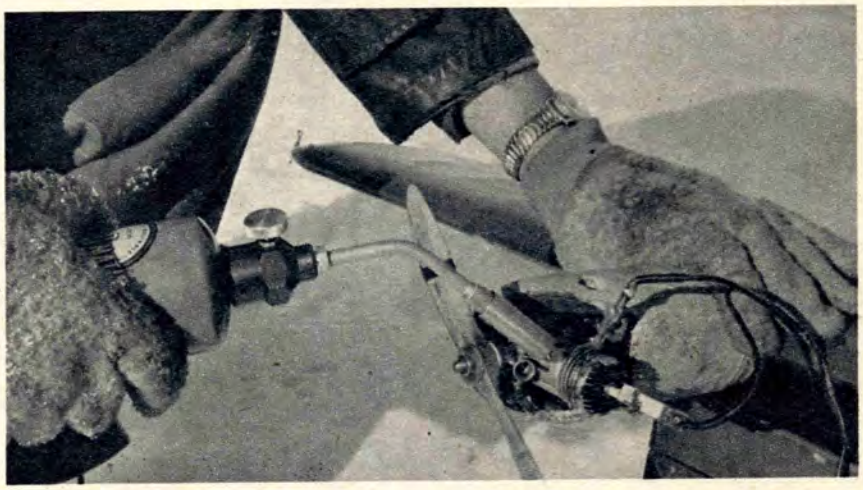
This butane blow torch is used to warm up engine and one should last several years. John found pocket lighter, matches inadequate.

To get that added heat, the right answer, we have found, is a butane blow torch. There are several kinds of such torches on the market, all good. They light easily with a match, won't blow out in any breeze you can fly in, and provide in one cylinder enough heat for several seasons of flying.

In using a butane torch to heat the motor, follow this sequence for best results: 1. Gas up. 2. Choke and give the prop a couple flips to fill gas line and crankcase. *Do not prime!* 3. Light torch, set at medium flame (blue cone about ¾ inch long). Play lightly on fins, on head, and if your fuselage design is open enough, on by-pass and cylinder walls. Avoid direct flame on porcelain of glow plugs such as Champion. About ten or fifteen seconds should do it, even in extreme temperatures. You want the motor heated just too hot to keep your hand on. If motor smokes from heating, you are boiling lubricant from outside of motor, and you have overdone it. 4. Prime *lightly.* (Not necessary if pressure tank is used.) 5. Hook up leads and start. (In very cold weather, hook up leads before heating to prevent heat loss while fumbling around with alligator clips with gloves on.

Once you get the motor started, proceed as during warm weather. Lean out mixture on ground (if you did not start full-lean, which is the better way in cold weather), disconnect leads and launch. In the case of some low-compression motors, however, you may have to keep head warm after starting to keep the motor running after the plug is disconnected. Old O&R .23's have this characteristic. Press accurately cut pieces of balsa wood between head fins, cutting them so they must be compressed somewhat to fit. They cut head radiation sufficiently to make a considerable difference. In such a case, heat cylinder wall fins only with torch. With sufficient additional heat, most any healthy low-compression motor will start perfectly in low temperatures.

We have found that Hornet, Dooling, DeLong (remember that one?—really great for stunt when glow-plugged and pressurized) will all start with no outside heat down to about fifteen degrees. And most motors in 8:1 to 10:1 compression range can be started with hand heat and sufficient struggle even at zero. You may have to pull the plug a few times, blow it clean and start again, but they can be made to start.



Burning up his stunt model? No, just playing a ¾-inch flame lightly on fins. Ten or 15 seconds is usually enough; if motor smokes you've overdone it. Keep flame and heat away from fuel!

Last, we recommend the motor be kept reasonably warm between flights. By this we mean to keep it warm to the touch. If you do so, no heating is necessary to restart. As the motor gets colder, fuel vapor in the crankcase and cylinder condenses into liquid, and lubricant becomes more viscous. That thick gooey stuff is sure death if it is thrown into glow-plug coil by motion of piston.

The best way to keep the motor warm between flights is to get the ship back in the air as quickly as possible, and to keep the motor out of the snow on landings. The Walker U-Reely Control is, to our mind, the answer to both. Unless some kind soul has shoveled a large rink on the ice we do not try to land after each flight. Rather, we crank the ship all the way in to our hands after the tank runs out. Nothing will cool a motor down quicker and make starting harder than a snow dunking.

Our whole bag of tricks can be seen illustrated with the stunt job: U-Reely Control, the battery box, butane torch, reactive fuel, and, lying on the wing, three things you need handy in your pockets. They are the plug wrench, the ammeter and matches. Additional and helpful to have out of the tool box are a screw driver and a spare glow-plug. The big tool box has room for plenty of fuel, the torch, and the necessary tools. It also provides a place to start ships without landing gears.

Three dry cells are hooked up in parallel to provide about 10 amps. Wooden box insulates them from the cold. Note the heavy lead-out.

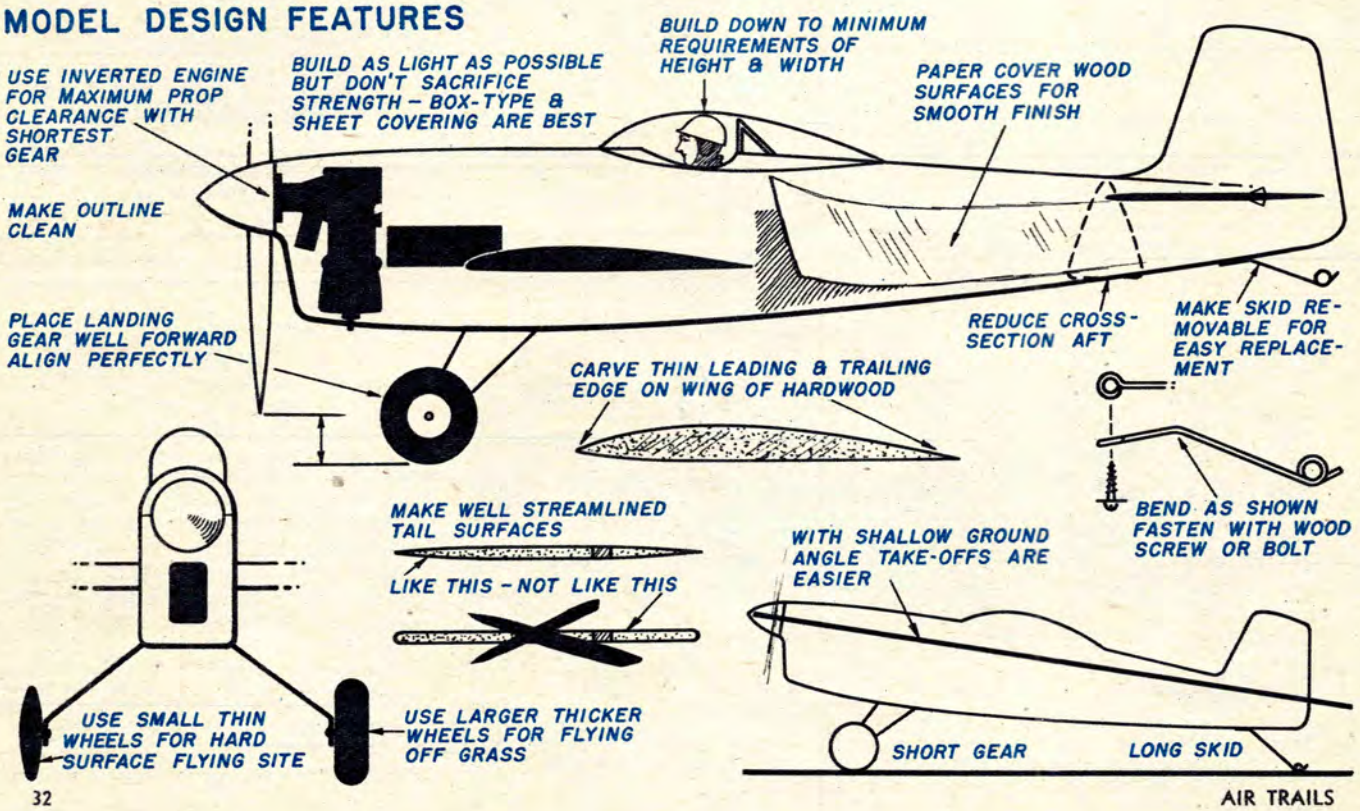
Secrets of winter flying revealed: on wing are an ammeter, matches and plug wrench. Also needed is large-size tool box to serve as a bench, U-Reely, battery box, butane torch and a reactive fuel.

Although the subject is a separate one, we cannot resist concluding with a word of recommendation on pressure tanks. One large factor in hard starting in cold weather is too-enthusiastic priming. If your shot of fuel into the exhaust port coats the catalyst, the motor is hard to start. Pressure-tank installations require no priming. Our pressure-tank installations of Hornet, Dooling and DeLong usually start on the first flip. One note—the number 80 hole usually drilled for pressure bleed may be enlarged to No. 60 wire gauge in the winter time.

AIR TRAILS
AIR MODEL MANUAL

Team Racing...

MODEL DESIGN FEATURES


USE INVERTED ENGINE FOR MAXIMUM PROP CLEARANCE WITH SHORTEST GEAR
BUILD AS LIGHT AS POSSIBLE BUT DON'T SACRIFICE STRENGTH – BOX-TYPE & SHEET COVERING ARE BEST
BUILD DOWN TO MINIMUM REQUIREMENTS OF HEIGHT & WIDTH
PAPER COVER WOOD SURFACES FOR SMOOTH FINISH
MAKE OUTLINE CLEAN
PLACE LANDING GEAR WELL FORWARD ALIGN PERFECTLY
REDUCE CROSS-SECTION AFT
MAKE SKID REMOVABLE FOR EASY REPLACEMENT
CARVE THIN LEADING & TRAILING EDGE ON WING OF HARDWOOD
BEND AS SHOWN FASTEN WITH WOOD SCREW OR BOLT
MAKE WELL STREAMLINED TAIL SURFACES
LIKE THIS – NOT LIKE THIS
WITH SHALLOW GROUND ANGLE TAKE-OFFS ARE EASIER
USE SMALL THIN WHEELS FOR HARD SURFACE FLYING SITE
USE LARGER THICKER WHEELS FOR FLYING OFF GRASS
SHORT GEAR
LONG SKID

Honeybug

By FRANK EHLING

■ The new .15s on the market make it possible to build a medium-size Team Racer in a short time. The plans for Honeybug show the Cub; the Torpedo can be adapted easily—to add excitement, see which can deliver the best speed.

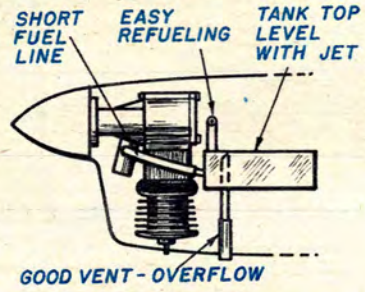
With the customary one-ounce tank a great many laps will be obtained; however, a half-ounce tank should make the event more of a team race, as here the pit man will have to show his stuff when the pinch is on.

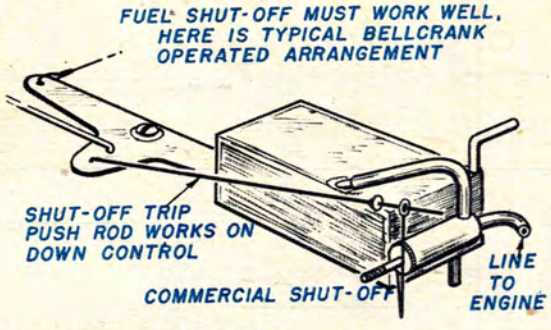
The inverted engine is nothing to fret about if a little bench running before installing is done, for no trouble will be encountered. The model was designed to have realistic lines, yet we cut down on cross section to clean up the rear. Large wheels were used; thinner ones could be substituted. Berkeley's Minnow canopy, Froom spinner and Veco bellcrank make up the special items.

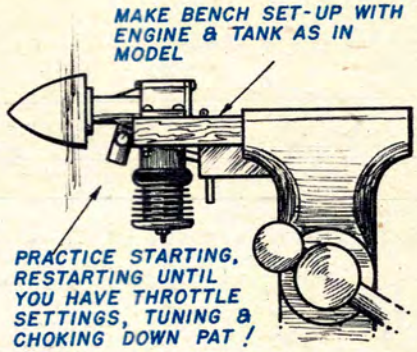
Cut the lower wing outline along with the necessary wing ribs. Cement these in place. Install bellcrank in position and press (*Continued on page* 74)

For Fun or Sport

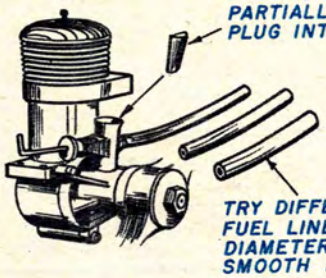
FUEL SYSTEM INSTALLATION



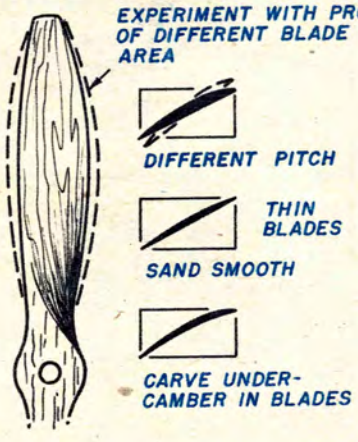

FUEL SHUT-OFF MUST WORK WELL, HERE IS TYPICAL BELLCRANK OPERATED ARRANGEMENT
SHUT-OFF TRIP PUSH ROD WORKS ON DOWN CONTROL
COMMERCIAL SHUT-OFF
LINE TO ENGINE

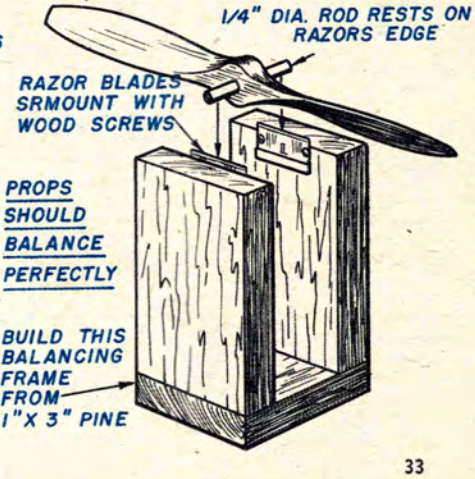

MAKE BENCH SET-UP WITH ENGINE & TANK AS IN MODEL
PRACTICE STARTING, RESTARTING UNTIL YOU HAVE THROTTLE SETTINGS, TUNING & CHOKING DOWN PAT!

GETTING MAXIMUM PERFORMANCE

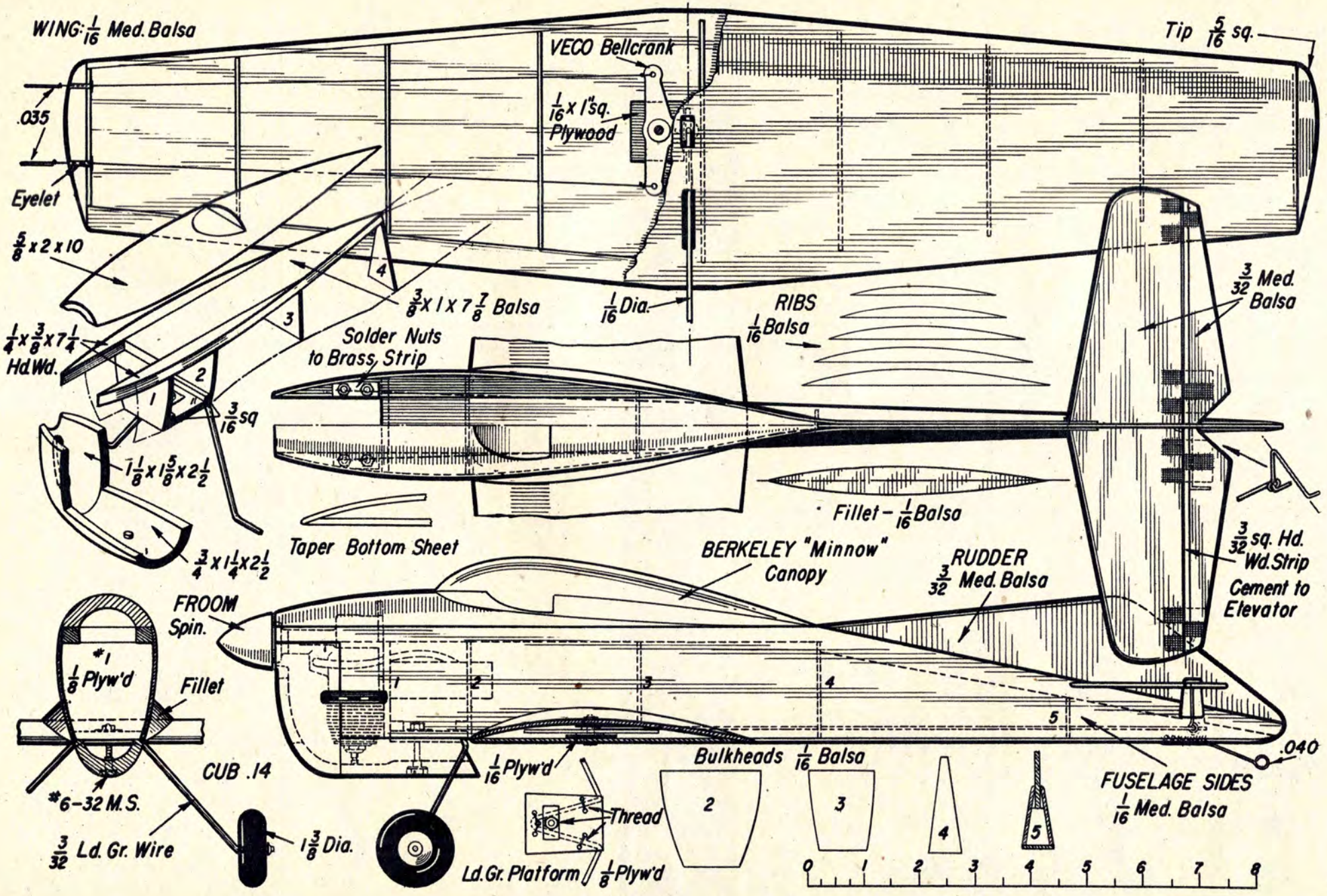


TRY DIFFERENT FUEL, GLOW PLUG & PROP COMBINATIONS




1/4" DIA. ROD RESTS ON RAZORS EDGE
RAZOR BLADES SRMOUNT WITH WOOD SCREWS
PROPS SHOULD BALANCE PERFECTLY
BUILD THIS BALANCING FRAME FROM 1"X 3" PINE

CAL SMITH



New group project: .15 cu. in. team racers! Great for contest flying and just plain Sunday afternoon stuff

We'd Like You to Meet...

More outstanding American model designers you will enjoy knowing: step up and say hello . . .

Bob Palmer . . . Seeing a friend involved in the complexities of model building, Bob felt he just had to try it. He was 12 then, and soon had had many successful free flight jobs. Got into U-control at the beginning. Amassed over 50 first place awards, mostly in stunt and scale. His famous designs include "Go-Devil," such Veco kits as "Chief," "Papoose," "Warrior," and many others. Had hand in design of fabulous Stearman of J. C. Yates. An accident to his right hand caused Bob to switch to smaller ships—led to development of small engine-large wing area jobs. His flaps now widely used. He is married, has daughter, seven. Is a member of AMA, Western Assoc. Modelers, and Burbank Sky Pilots. A top man in U-control scale, he won this class at '48 Nats.

Harry G. Vogler, Jr. . . . Harry is that energetic little fellow you always used to see squiring the Air Force model plane teams at various big meets. He was A.F. Project Officer for model aviation all over the world. Organized and ran A.F. Model Airplane Championships in 1951, also ATRC Model Airplane Championships same year. Repeated this work in 1952; activity will probably continue as A.F. has found it to be very popular. Harry built his first model in 1927. Now a civilian working with Chance Vought in Dallas. Active flying in his family now taken over by wife Vivian (who flies speed), daughter Patsy who also favors U/C. Son James now teaching modeling, while serving in Navy. Youngest son Harry III is eight. Harry holds AMA 146.

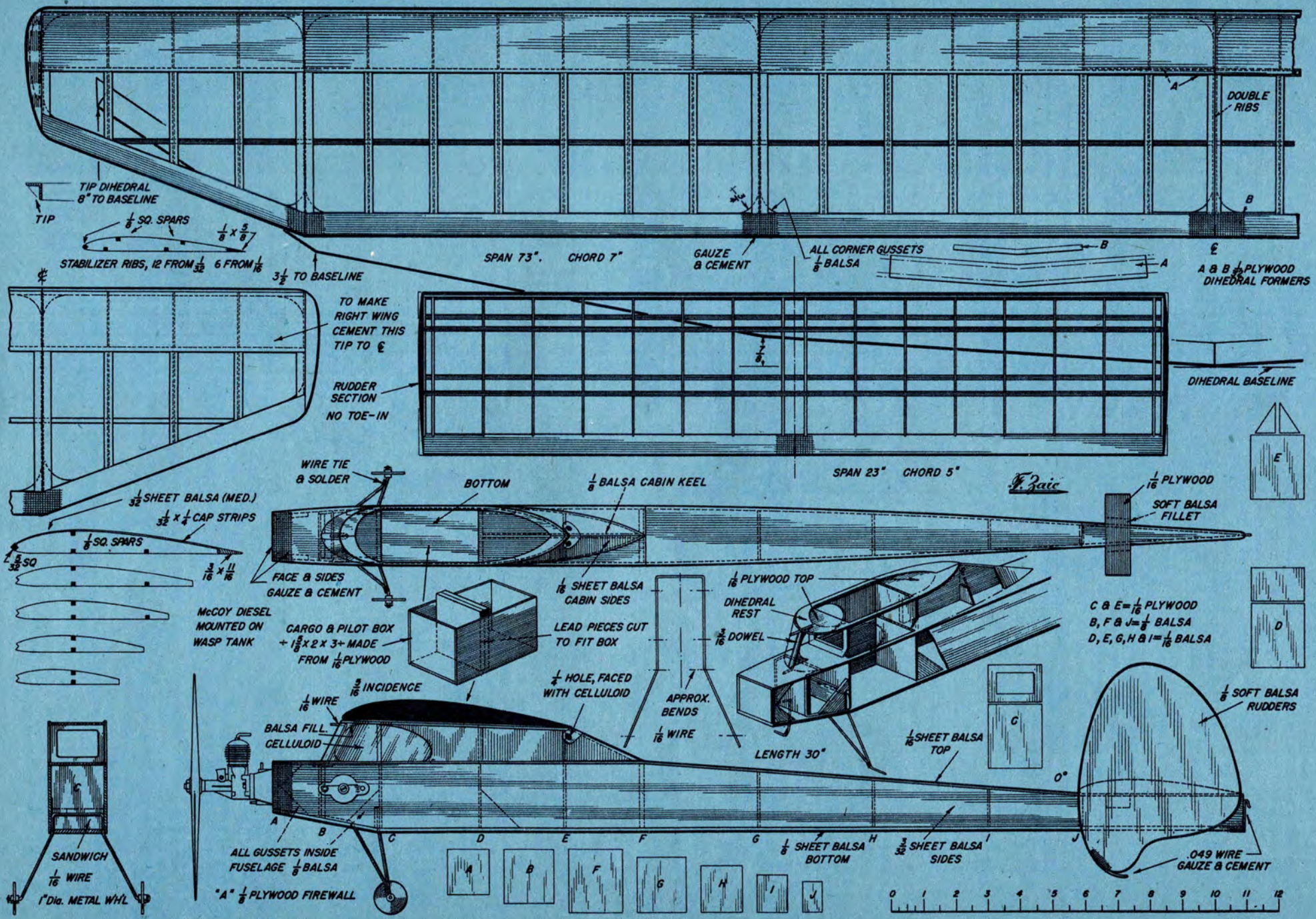
Henry Struck . . . Designer of some really famous ships of the past and present, Hank is now an engineer for a welding concern in Connecticut. He was manager of Pratt-Reed glider factory during the war. Formerly an ardent contest flyer, he was National Champ in 1941, Junior Birdman Champ (N.Y. Wing) in '35 and '37. Won Nats Flying Scale Event in '38, '41, '46, and his scale designs—Interstate Cadet and Stinson L5—have won for many other modellers as well. Set Indoor Cabin record in 1938 and Gas F/F records in '39 and '40. Many of his designs have been kitted, one of the most famous being the "New Ruler" (later called "American Ace"). Others are "Flying Cloud" and "Bootstraps," the latter a PAA-Load, R/C job. Glider pilot and flies regularly. Designed the ship flown by Gene Stiles that gained the F.A.I. model gas speed record for U.S. in 1951. Probably first to fly research models faster than sound (2" metal jobs shot by gun!). Married, member Lyme Cloud Cowboys.

Phil D'Ostilio . . . Modelers in the New England-N.Y. area don't need to be told about Phil. He is always busy with contests, organization work of some sort or another; is past president of Bridgeport Aeronuts, active in CCAMA. Now an aircraft engineer with Sikorsky, he spent 17 months in the Air Force. Interest in modeling and aviation in general came when he saw neighborhood boys flying tiny rubber models—a local contest clinched it. He took 1st in R/C at Mirror Meet, a second at Boston Wakefields Eliminations, and 10th in the Semi-Finals. As might be noted, he is much interested in contest rubber ships, but has tried his hand at all sorts of modeling. Has ham radio license with call W1THC; plane and ham interests go together. Married.

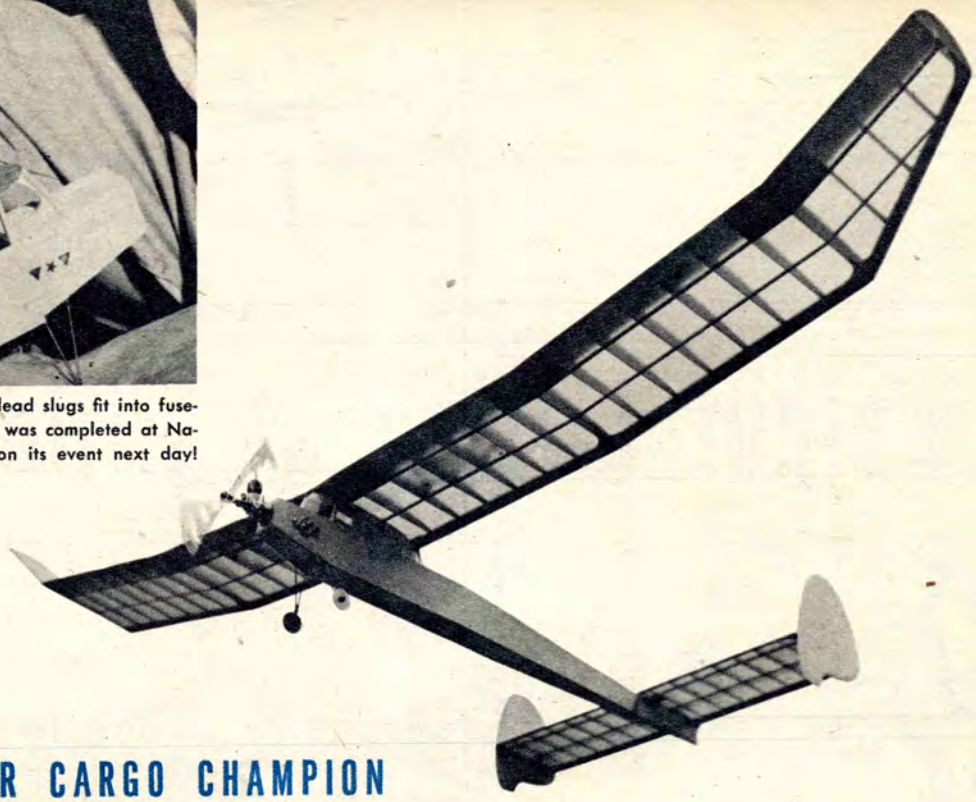
Herbert Davis . . . One of the youngest of our group of famous modeling personalities, Herb specializes in the high speed categories. Got his start in model work simply by seeing a plane hanging in a hobby store—just had to try one himself. Herb has really been traveling since. Not content to use work of others, he has designed several of his own, and flown them to records. Started winning top places in 1949 at Detroit Internationals (High Point Junior), and really went to town in 1951, when he was Internats High Point Senior winner, got Air Trails' Kulick Trophy at Nats for Senior D Speed; also took 1sts in B and Jet Speed at same meet. Set Sr. AMA Jet record. The piston-powered ships were his "Gofer." The jet job was the "Hot Canary."

Roger Barron . . . Selected by the Boy Scouts as the "most consistent winner in the Junior Division" of the model aviation contest circuits, Roger has retained his interest in all things pertaining to engineering and is now a student at Princeton. Has won so many trophies, plaques and medals that there is no present count. A member of the famed "Flying Barrons of Virginia," a family in which every member engaged actively in modeling. Got his radio amateur license at 13 and was soon busy with R/C models. Was selected for the Plymouth Internationals four times; won seven trophies at Detroit. Has won many more at National meets, cleaned up at the mid-winter Tangerine Internationals several times, been high-point winner at the National Capitol Meet.

Bill Johnke . . . The take-off of Lindbergh's New York-to-Paris flight inspired Bill to try his hand at modeling (he attended this event in person—lived on Long Island), and he did odd jobs at one of the few model plane concerns then in business—Broadfield Model Airplane Co. Learned by trial and error, since there were no clubs and few good kits then available. Claims no records and no outstanding model designs. Bill's fame in the field stems from his helping others, through management of contests (CD at various Long Island Plymouth meets, also Screamin' Demons Annual meets) and his aid to local Police Club and Scout model promotions. However, has placed in most every meet in which he has entered in past five years. While primarily a F/F addict, leg weariness prompted him to turn to R/C; now has ham license, secured just for this purpose. Is an architectural designer, married and has two potential modelers in family, Billy Jr. and Betty Lou. Served 3 years in Signal Corps.


TIP DIHEDRAL 8" TO BASELINE
TIP
1/8 SQ. SPARS
1/8 x 5/8
STABILIZER RIBS, 12 FROM 1/32 6 FROM 1/16
3 1/2 TO BASELINE
SPAN 73". CHORD 7"
GAUZE & CEMENT
ALL CORNER GUSSETS 1/8 BALSA
DOUBLE RIBS
A
B
A & B 1/16 PLYWOOD DIHEDRAL FORMERS
TO MAKE RIGHT WING CEMENT THIS TIP TO ℄
RUDDER SECTION
NO TOE-IN
DIHEDRAL BASELINE
SPAN 23" CHORD 5"
WIRE TIE & SOLDER
BOTTOM
1/8 BALSA CABIN KEEL
1/16 PLYWOOD
SOFT BALSA FILLET
1/32 SHEET BALSA (MED.)
1/32 x 1/4 CAP STRIPS
1/8 SQ. SPARS
3/32 SQ
3/16 x 11/16
FACE & SIDES GAUZE & CEMENT
McCOY DIESEL MOUNTED ON WASP TANK
CARGO & PILOT BOX 1 5/8 x 2 x 3 MADE FROM 1/16 PLYWOOD
1/16 SHEET BALSA CABIN SIDES
LEAD PIECES CUT TO FIT BOX
1/16 PLYWOOD TOP
DIHEDRAL REST
3/16 DOWEL
C & E = 1/16 PLYWOOD
B, F & J = 1/8 BALSA
D, E, G, H & I = 1/16 BALSA
3/16 INCIDENCE
1/16 WIRE
BALSA FILL
CELLULOID
1/4 HOLE, FACED WITH CELLULOID
APPROX. BENDS
1/16 WIRE
LENGTH 30"
1/16 SHEET BALSA TOP
1/8 SOFT BALSA RUDDERS
SANDWICH
1/16 WIRE
1" Dia. METAL WHL
ALL GUSSETS INSIDE FUSELAGE 1/8 BALSA
"A" 1/8 PLYWOOD FIREWALL
1/8 SHEET BALSA BOTTOM
1/16 SHEET BALSA SIDES
.049 WIRE GAUZE & CEMENT
0 1 2 3 4 5 6 7 8 9 10 11 12

Designer Roth shows how dummy and lead slugs fit into fuselage of his Clipper Cargo model. Ship was completed at Nationals after photo was made—and won its event next day!



NATIONAL CLIPPER CARGO CHAMPION

Blueboy

This, folks, is the Half-A job that lifted an incredible 23¼ ounces to win Pan Am crown

By HAL ROTH

■ *Blueboy* was designed with three requirements in mind: a good engine, an extremely large wing, and a rearward-placed landing gear with metal wheels. When it was designed, we felt the Cargo Clipper models fully capable of lifting 30 ounces of dead weight. The 500-square-inch wing was made about equal to a small Class B gas model so the glide would be slow and the landings easy. A flat-bottomed 10% section was used in the wing to speed take-offs. The structure of the model was made as light as practicable, commensurate with good Wakefield practice.

On the first flight at the Philadelphia Nationals, *Blueboy* lifted 23¼ ounces for 42 seconds, establishing a new AMA record. On a later attempt, *Blueboy* lifted 26½ ounces for 2:40 but was disqualified for a motor overrun. Gr-r-r!

The Clipper event is a real challenge because no one has flown a gas model *on its wings* since the days of Maxwell Bassett. Twenty-four ounces of dead weight inside a Half-A model slows it considerably. However, the weight catalyst introduces two interesting by-products: (1) no long chases and (2) the ships fly at slow speed (estimated at 10 mph) and can be tested with the engine wide open with no crash danger (assuming you start with 20 or 24 ounces of ballast).

Best of all—you may call it sentimental hogwash—all the Clipper ships must take off under their own power. The little models really work to get off the deck and it is a genuine thrill to see them lift their load and fly off.

Cut 30 wing ribs from soft 1/32" sheet. The tip ribs can be formed as the tips are built. Use light wood for the spars and leading edge sheeting. The center section has three 1/32" plywood dihedral braces. Hollow out the balsa tips on the bottom. Put gauze reinforcements at every dihedral break.

Cut six stabilizer ribs from soft 1/16" sheet and 12 ribs from 1/32" sheet. Use a square to make certain the tips are perpendicular to the center of stabilizer so the rudders will go on straight. Install gauze reinforcements at the trailing edge center. The rudders are cut from soft ⅛" sheet.

For the fuselage select a straight-grained piece of 3/32 x 3 x 36" and cut diagonally in two. The fuselage sides are cut from (*Continued on page* 75)

Weight Lifting at Willow Grove

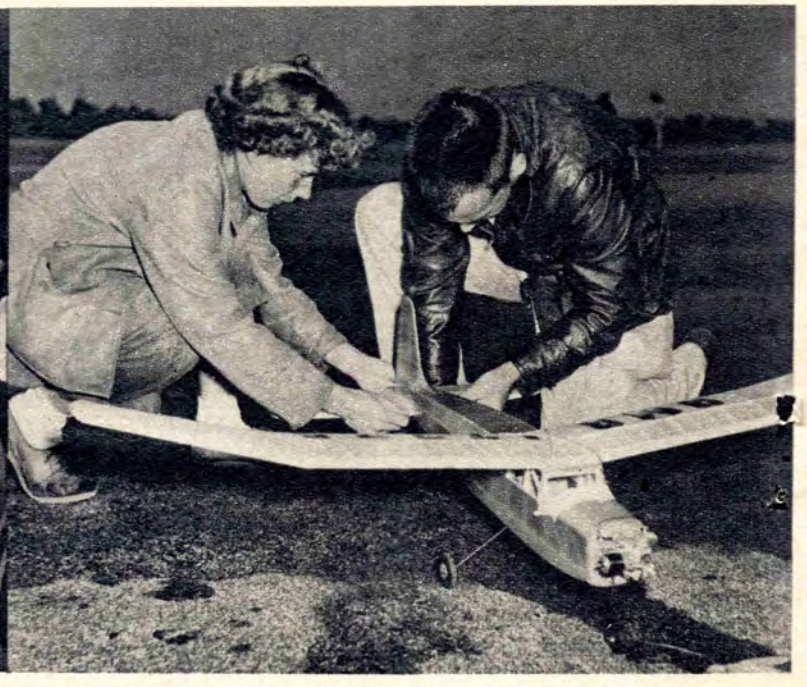
Off to third place in Half-A PAA-Load (combined Junior & Senior class) goes model flown by Thomas Marden, Highland Park, Mich. Ship scored 6 mins. on previous hop, but suffered midair crack-up on this flight. Tom did 7:38 total. High Half-A time was 12:59 by Richard McGrath, also of Mich.

It's all work and no play for the poor model that finds itself entered in the big Pan American payload contest . . . what an awful way to go: snap, crunch crash!

Photos by H. A. THOMAS

■ Pan American World Airways has made a significant contribution to the air-modeling sport with its weight lifting awards, but no phase of PAA-Loading produces more original thinking, more unusual entries, or more suspenseful moments than the Model Clipper Cargo Event. Requirements sound simple enough: take one free flight model of any size or shape, power it with any engine under .051 cubic inch displacement, add one PAA-Load dummy 3 x 1½ x ¾ inches weighing 4 ounces, pile on an additional load of any weight you desire, then with an engine run not exceeding 20 seconds

PAA-Load processing produced pretty plane models and maidens. Trio of earnest judges from left: Frank Bushey, former A.M.A. president, Harry McCall of Cleveland, & George Gardner, Pan Am Educational Director.



Laura and Darrel Pengh from Rockville, Md., assemble their Bootstraps. California contenders walked off with two 1st places in the PAA-Load events; Ohio, Michigan, New York and Pennsylvania got one each.

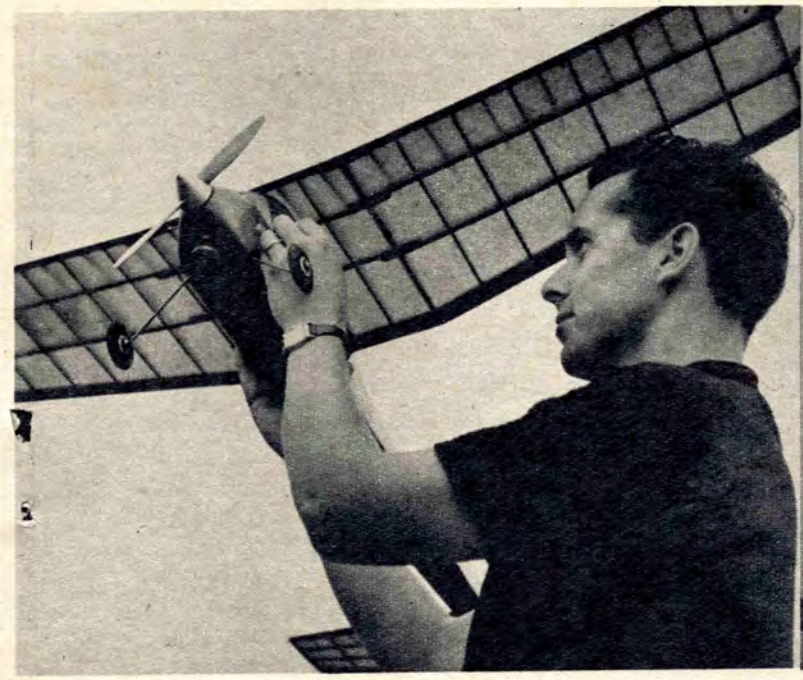
Here is model flown by Ted Gonzoph of Philadelphia to first place in the Experimental rubber event. Ted did 6:05.5; all age groups competed as 1.

Ernie "Sky Guy" Shailor, Detroit, used 4-wheel landing gear on Clipper Cargo entry; Space Bug engine. Flew 56 sec. with 22½ oz. to 2nd place.

pray for a flight of not less than 40 seconds. Oh, yes, the model must rise-off-the-ground "under its own power and without assistance" and at the conclusion of the flight "must be presented . . . for inspection to prove that it landed safely with pay load."

Simple, hey? Only rub is that while you are applying—gingerly—an additional cargo of steel washers weighing a tremendous 10 ounces, some character like Hal Roth of Richmond, Calif., comes along, loads up his "Blueboy" with not 11 or 12 ounces, but 23¼ ounces of extra weight and walks off with the National Clipper Cargo championship. So on the long drive home from the Nationals you keep thinking just how far you can go to cut down structural weight, yet retain that necessary strength. . . .

That old aeronautical problem of weight *vs.* strength for the first time since the heyday of the indoor model has a very real application now to competition craft. As a result cargo entries utilize such rarities as exterior bracing, geodetic construction, hollow spars and lightened wheels. . . . In the opinion of many: the hardest, yet most satisfying event.



Hail the top man: Lew Mahieu whose 13:56.1 was high time of all weight lifters. The Long Beach, Cal., whiz won Cl. A-B under low clouds. He cut engine well below 20 sec. to keep in sight. Modified Kiwi, K&B .19 engine.

Clipper Cargo brought out strange designs. John Stiles (lt.), from Hillsdale, N. J., used 480 sq. in. while Roger Capwell of Stroudsburg, Pa., stuck to medium size 200 sq. in. wing in single engine "Skyrocket."

Sea Scooter

By AUBREY KOCHMAN

Simplified radio controlled air-prop power boat can be made in a couple of evenings . . . check your balsa wood bin, boys, let's get cementin'!

■ With the growing interest in R/C boats among dyed-in-the-wool model airplane enthusiasts, I decided to get into this new (for me at least) sport to see first hand what was the big attraction. A visit to our local park lakes soon convinced me that R/C boating, although perhaps not as exciting or hair raising as R/C planes, can afford a very enjoyable afternoon in very pleasant surroundings. Then, too, a boat makes a perfect test-bed for trying out new gadgets, ideas or untested radio equipment; the chances for out-of-sight runs and crack-ups are practically nil.

With a prod from editor Al Lewis, I decided to design a simple-to-build flat-bottomed hull having good planing characteristics at model speeds. For simplicity's sake an air screw, non-scale design was chosen.

Sea Scooter more than justifies these claims. Anyone who has ever built a model airplane will find himself right at home constructing this model which incidentally should require only a few evenings. "Boomerang" R/C equipment was used in the original, but any other type may be chosen so long as it is positioned in the hull without changing the water line indicated on the plans. The water line should be checked with the model at rest. When underway *Sea Scooter* rides at a higher angle of attack and draws even less water.

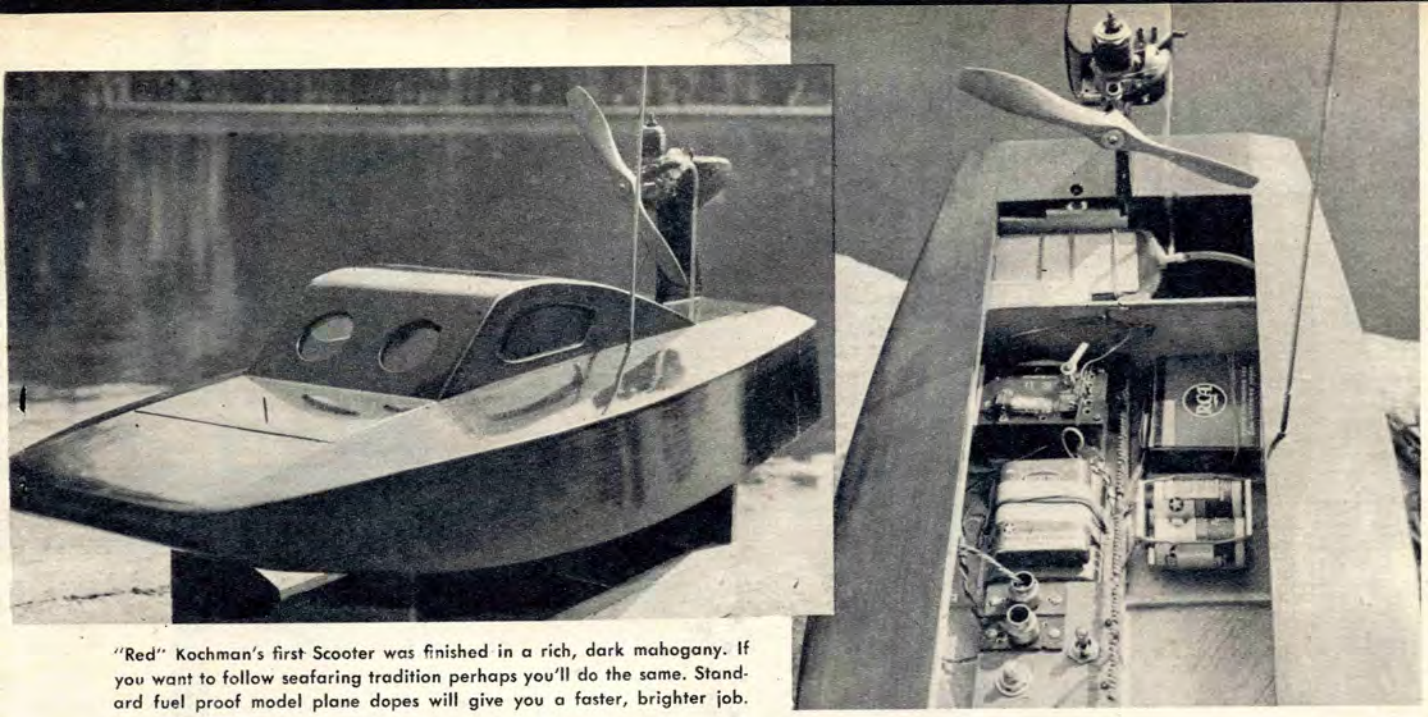
The plans presented differ slightly from the original at the engine nacelle. First the fuel tank was located in the nacelle but this proved unreliable and due to the small sized tank used it limited engine run to under four minutes. With the "Jim Walker" pressure tank and fuel regulator an .074 Cub can be kept running steadily for 15 minutes or more.

Start construction by laying the 3/16" sq. pieces along the outside curve on top view. Mark off the upright positions. If this is not done your frame will be about ¼" shorter than shown, due to the curve. The "longerons" thus marked may now be pinned down on side view with the extra length extending at *rear*. Cement the uprights in place where previously marked. Build second side directly on top of the first. A piece of wax paper between them will insure easy separation. Assemble the frame upside down on top view as shown in Step 1. Continue construction on down through Step 3, but cement the front escapement-rubber hook in place before adding the front deck piece.

Drill hole for the brass tubing rudder post through the bottom and the keel. Cement tubing in place against the pylon and reinforce with a strip of cloth. Make up tank box from 3/32" sheet. The escapement-rudder linkage is next bent to shape. Cement the tubing to the bottom of tank box in line with the rudder and reinforce with a cloth strip. Finish covering the hull and add the nose block and the engine mount. Cut off the 3/16" sq. top cross braces but allow front one to extend ⅛" to act as a seat for the cabin. Assemble the cabin as shown in Step 4. The two front windows are 1⅜" dia. Clear plastic is cemented in place from inside on all windows.

Painting is strictly a matter of choice. If you want a colorful craft follow the same procedure as you would on a control line stunt model: first a sealer, then several coats of colored fuel proof dope—maybe two-tone. Cabin top one color, hull and deck another. If you wish to finish your model in a rich dark mahogany, as the original was, here's how it was done. Bear in mind that wood stains do not take well over model airplane cement. Therefore try not to get cement on outside surfaces where stain is to be applied.

Brush on a dark mahogany alcohol stain



"Red" Kochman's first Scooter was finished in a rich, dark mahogany. If you want to follow seafaring tradition perhaps you'll do the same. Standard fuel proof model plane dopes will give you a faster, brighter job.

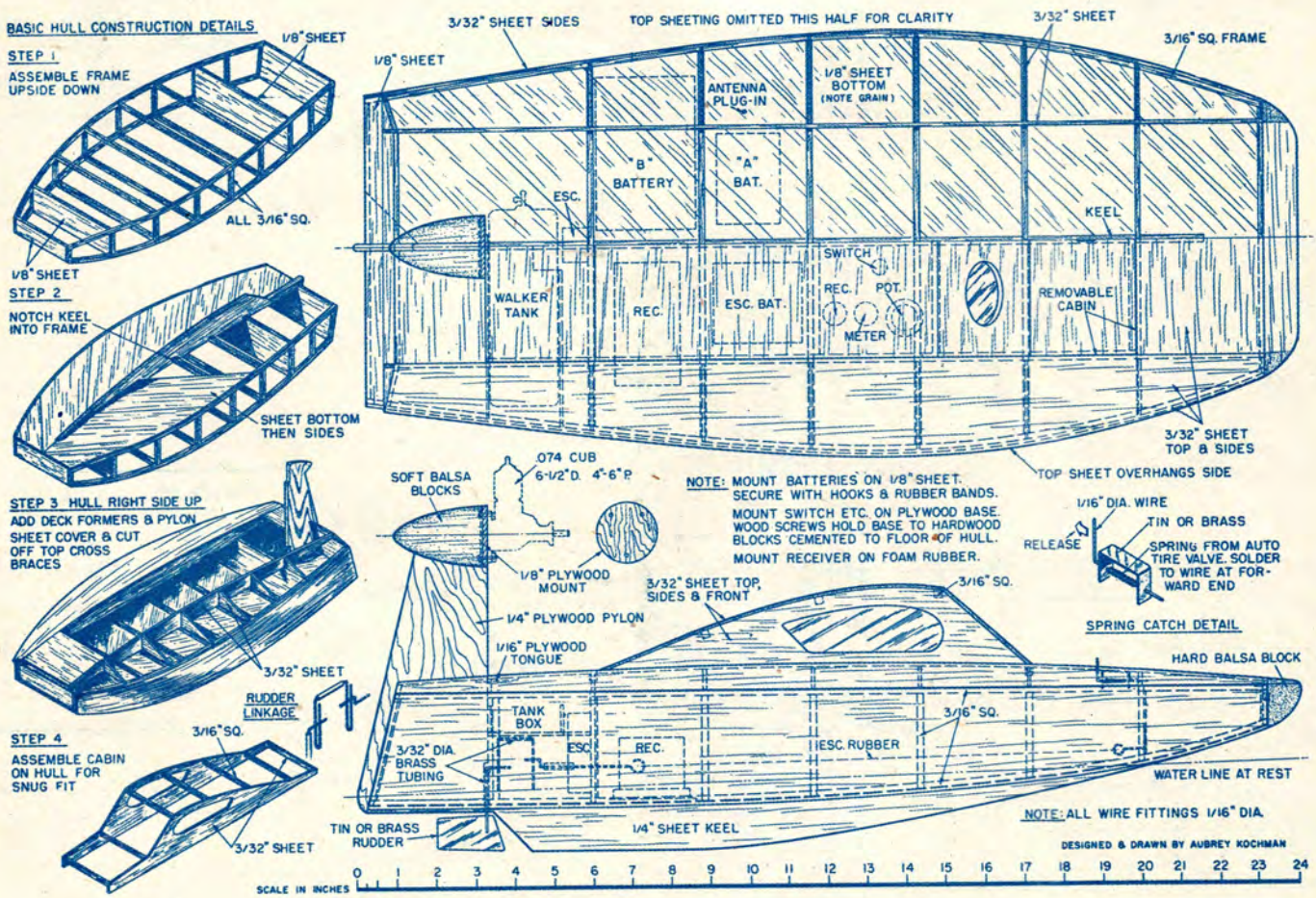
directly to the raw wood. Control the color by wiping dark areas with a clean cloth and applying additional coats to light areas. When the stain is dry, brush on one coat of any good commercial mahogany wood filler paste. This filler should be the type that is rubbed off against the grain of the wood about five to ten minutes after applying. The filler should be allowed to dry according to directions on the can, usually overnight. Incidentally, there is no need to sand this type filler.

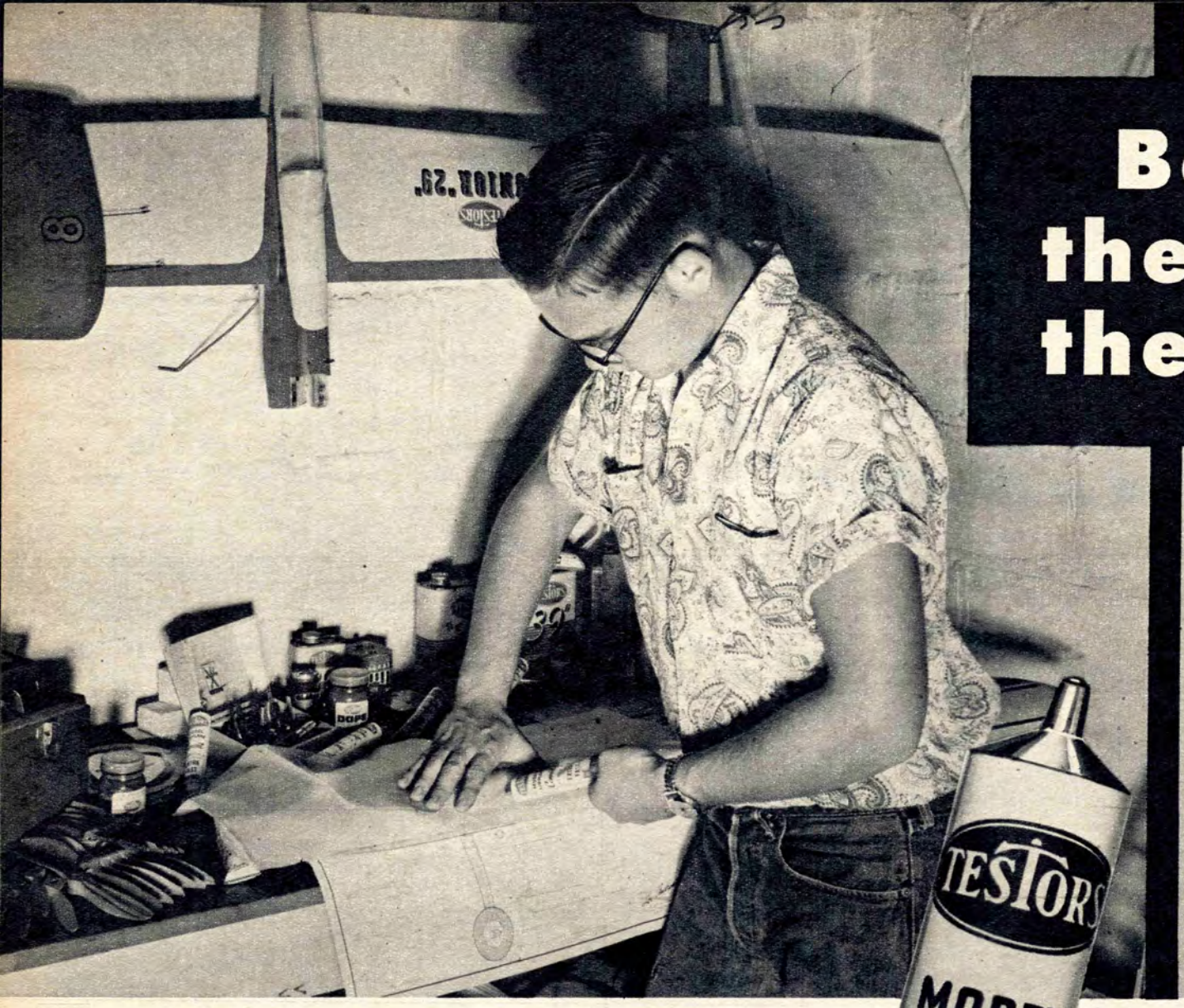
Next, apply two coats of lacquer sanding sealer. The last coat should be sanded smooth with very fine sandpaper. At this point, if you are not satisfied with the overall color or grain characteristics, go over it again with a cloth dipped in the stain. You can thus alter color and grain to suit yourself. For final finishing coats use a good quality alcohol-proof varnish such as Pratt & Lambert Bar Top Va nish. Hull interior was not stained but ven two coats of varnish.

This little baby really scoots! Don't try anything over an .099 without first dropping the anchor!

Bill of Materials

6 pcs. 3/16" x 3/16" x 36". 4 sheets ⅛" x 3" x 36". 6 sheets 3/32" x 3" x 36". 1 sheet ¼" x 3" x 36". 2 pcs. ¾" x 1½" x 2⅜". 1 pc. 1" x 1¼" x 7". ¼" plywood, ⅛" plywood, 1/16" dia. wire, tin or brass, auto valve spring, 3/32" dia. brass tubing, clear plastic, finishing materials.





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"A"

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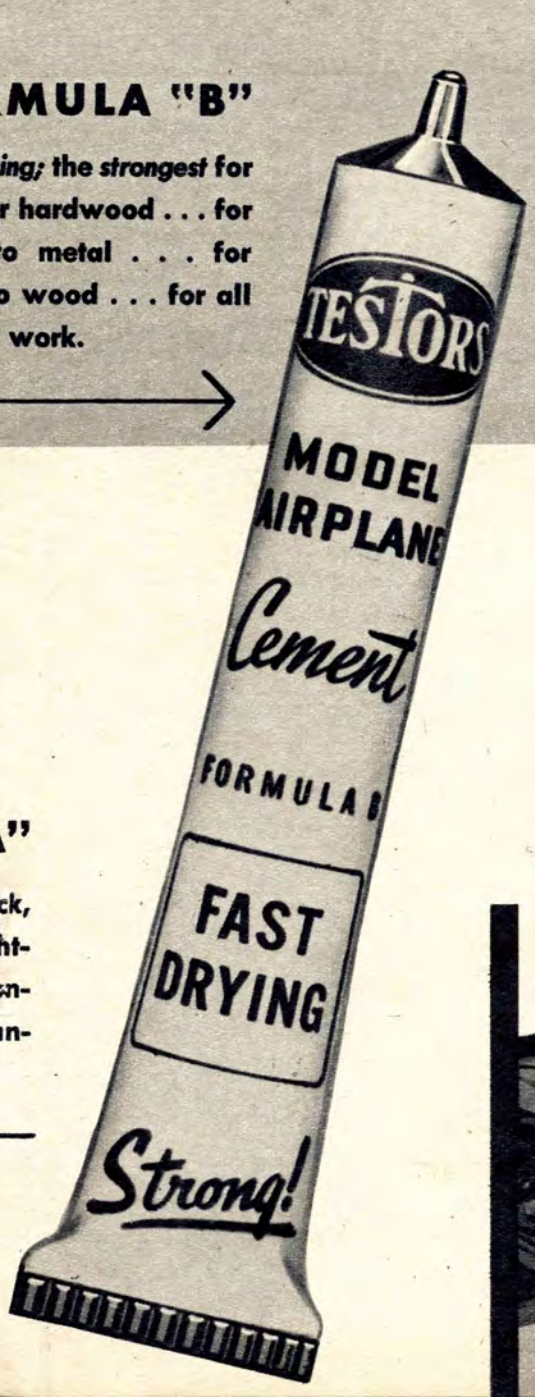
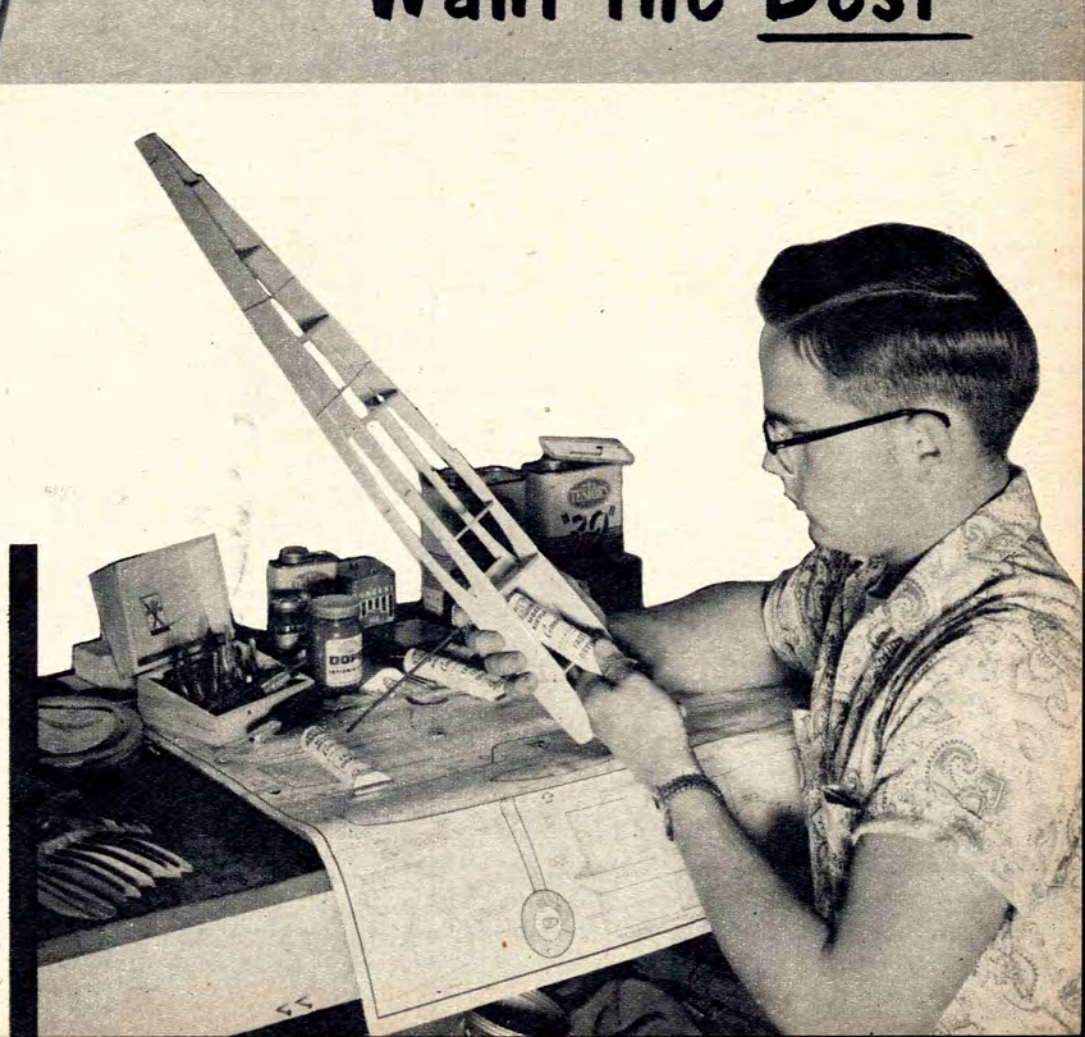




Mitchell Bomber

Speedee-Bilt by Monogram is faithfully scaled

■ The makers of this kit, Monogram Models (Chicago 32, Ill.) modestly advertise it as a "Deluxe" production. If anything, this is an understatement. The balsa wood is of the highest grade, the 34 plastic parts are clean and beautifully detailed, and the packaging is most intriguing. This firm has long featured realistic plastic parts in their scale kits, and they have gone all out in their two new twin-engine bomber sets. These are for the Martin B-26 Invader, and the B-25 Mitchell, the latter our concern here.

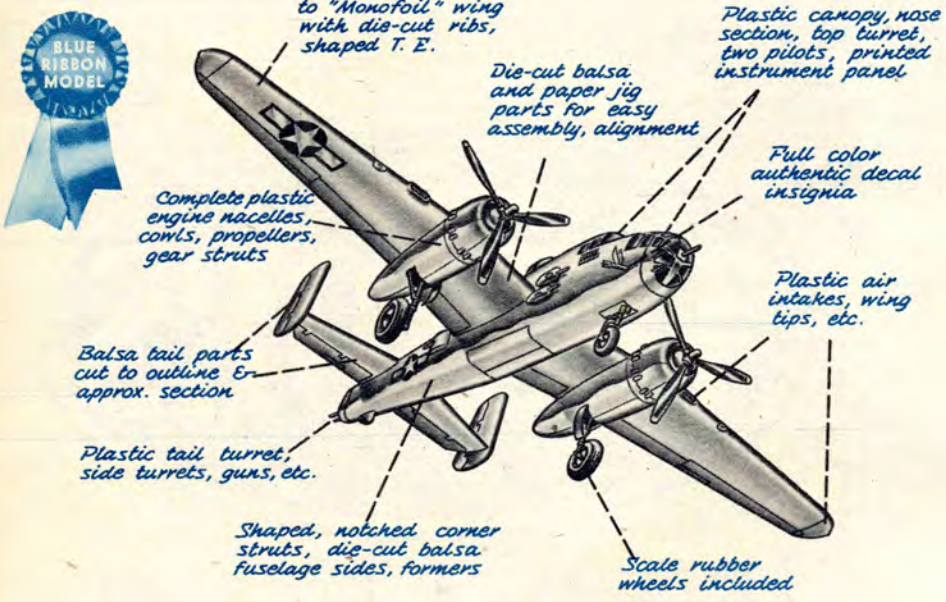
Construction follows in general that of other Monogram Speedee-Bilt models, some of which have been covered in this series. We'll cover the work as it is described in the very comprehensive instruction booklet. First you build up the Speedee-Jig, which is the heart of the model, and around which fuselage and wing are assembled. Next come the wings. These consist of two hollowed balsa shells, a set of die-cut ribs, and a longitudinally grooved trailing edge.

You now start on the fuselage, by sliding the full-length side pieces onto the wing and Jig. Top and bottom are made from strips and blocks that are already rounded off. The complex cockpit covers are of clear plastic, with all the frame details moulded in. Before they are attached, though, the assembly should be treated with balsa sealer and sanded smooth.

The tail surfaces are sheet balsa milled to airfoil shape and require only a little sanding (both coarse and fine sandpaper are furnished in the kit).

Such usually difficult parts as props, nacelles, landing gear struts and engine cowlings are ready made of plastic. Each nacelle is in two halves, and they just slide over the completed wing. The wheels are all of rubber.

A really complete set of decals, plastic pilots, turrets and guns help to make the model authentic. Further aid to this end is the full-size 3-view sheet of the finished model, which also carries a short history of the B-25, plus pictures of the model and others of several variations of the full-scale Mitchell bomber.


BLUE RIBBON MODEL
Pre-shaped surfaces to "Monofoil" wing with die-cut ribs, shaped T. E.
Plastic canopy, nose section, top turret, two pilots, printed instrument panel
Die-cut balsa and paper jig parts for easy assembly, alignment
Full color authentic decal insignia
Complete plastic engine nacelles, cowls, propellers, gear struts
Plastic air intakes, wing tips, etc.
Balsa tail parts cut to outline & approx. section
Plastic tail turret, side turrets, guns, etc.
Shaped, notched corner struts, die-cut balsa fuselage sides, formers
Scale rubber wheels included

Jetex Race Car

American Telasco's car is jet propelled

■ This novel outfit is not a kit, but a ready-to-run racing car, propelled by the potent little Jetex 50 solid-fuel jet engine. A product of American Telasco Ltd. (Huntington, N. Y.), it consists of a finished car, jet engine with four fuel charges, and a good husky box which is fitted for use as a pylon, when the car is to be run on a circular course.

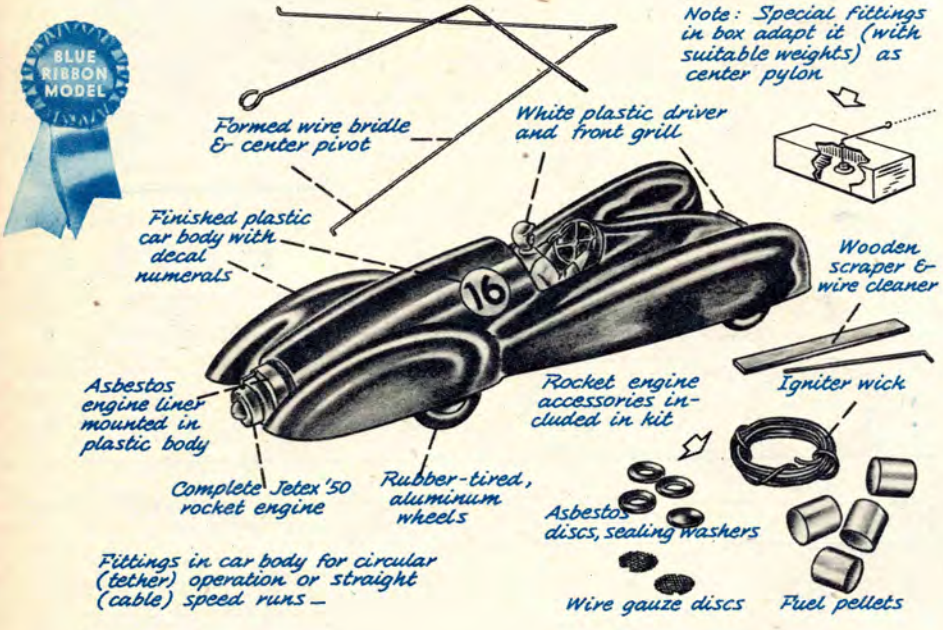
The Jetex 50 engine is the same one which has become well-known for model plane applications, and besides the fuel, you get lighting wicks and all components to run this unit.

The car itself is a streamlined little job about 6¼" long and weighing 1.6 oz. without the engine. It is composed of two pieces of acetate sheet, the outer shell being brightly colored. The inner "chassis" piece holds the wheel axles and the assembly is surprisingly rugged. The wheels are turned aluminum with circular cross-section rubber tires, and revolve very freely.

At the rear of the body is an asbestos tube, so moulded that the Jetex unit slides into it and is held snugly, but is very easy to extract. The acetate material used in the car body is not highly inflammable, though it will char if held in a match flame. It is therefore considered entirely safe for use in this model, which is, of course, propelled by the burning of the solid fuel inside the Jetex engine.

The model may be run either of two ways. In a small space you can let it run tethered around a central pylon; the box is fitted for this use, with an eyelet in the top and plastic bearing cemented to the bottom. The box must be loaded with several pounds of stones or other weight. A nylon thread of no less than 4½ feet length connects the metal bridle on the car to the revolving pylon wire. Up to a 15 ft. circle can be used, if there is room enough.

Straight line travel is accomplished by stretching a nylon thread of about 200 ft. length between two weights; the thread is run through two lugs under the car. The car will not operate successfully without this guide line. On a good smooth surface, speeds of 25 mph and more can be attained.


BLUE RIBBON MODEL
Note: Special fittings in box adapt it (with suitable weights) as center pylon
Formed wire bridle & center pivot
White plastic driver and front grill
Finished plastic car body with decal numerals
Wooden scraper & wire cleaner
Asbestos engine liner mounted in plastic body
Rocket engine accessories included in kit
Igniter wick
Complete Jetex '50 rocket engine
Rubber-tired, aluminum wheels
Asbestos discs, sealing washers
Fittings in car body for circular (tether) operation or straight (cable) speed runs—
Wire gauze discs
Fuel pellets

Bobcat — Kenhi's revamped stunt design is livelier

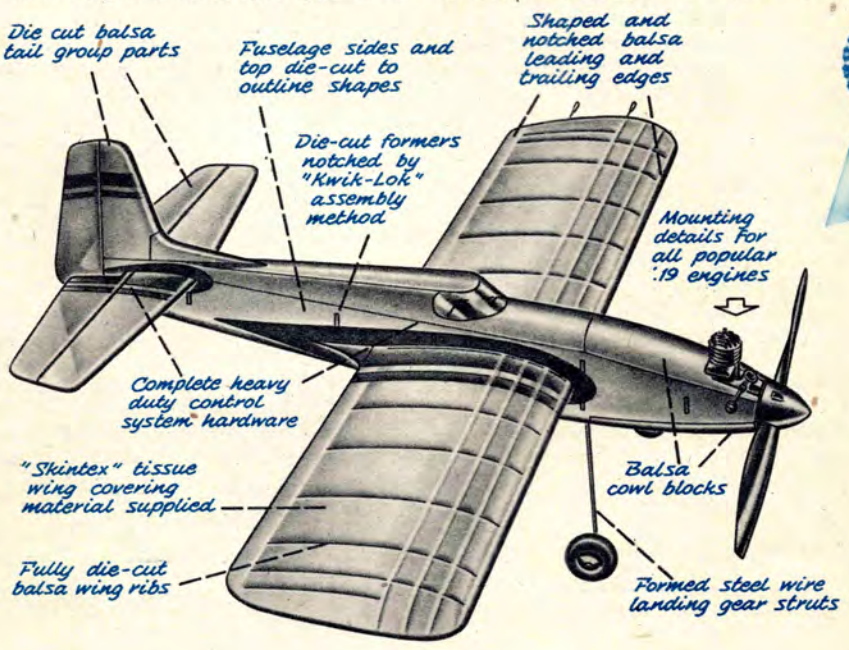
■ Retaining the general appearance and size of the Kenhi Bobcat that has been on the market for some time, this is actually a brand-new ship, with new construction features, and above all—new performance. Designed by Hi Johnson, and produced by Kenhi Model Products (Burbank, Calif.) the Bobcat is a semi-scale stunter of top flying capabilities. Just to show the differences between this and the older Bobcat, which spanned 39", had 387 sq. in. area, and weighed about 2 lb. ready to fly, note these specs: span 37", area 324 sq. in., average finished weight 19 oz., will carry engines from .14 to .35. With this reduced weight and a good .35 engine, the Bobcat will do anything the most advanced stunt pilot asks; with a .19 in the nose it is a docile but still plenty lively sport flyer.

The fuselage features Kwik-Lok construction; the full-length sheet side members are punched out to hold the formers in place while the cement is drying. There is a sheet balsa doubler from the nose to the trailing edge of the wing. After the basic assembly has been made, the sides are extended upward with sheet balsa, and topped off with 3/16" sheet, which is later rounded off. The fuselage underside is closed in with sheet balsa applied cross-grain. The plans show complete installation details for five different engines, including tanks, vents and access holes, as needed for each. The landing gear is of the single leg type, with the 1/8" hard wire fully bent. 2" or 2¼" wheels are suggested, with a conventional tail skid.

Tail surfaces are of sheet balsa, with cloth-hinged elevators. The horn is built up and brazed together for strength. Control system is fully detailed and all parts are included.

The wing is a multi-spar type as in the older Bobcat and the HJ03515 symmetrical airfoil is retained. Ribs are die-cut, of course, and are punched out for lightness.

The plans are on two large sheets, and are full-size throughout, except for construction detail sketches. Plans and written instructions are quite good.


Die cut balsa tail group parts
Fuselage sides and top die-cut to outline shapes
Shaped and notched balsa leading and trailing edges
Die-cut formers notched by "Kwik-Lok" assembly method
Mounting details for all popular .19 engines
Complete heavy duty control system hardware
"Skintex" tissue wing covering material supplied
Balsa cowl blocks
Fully die-cut balsa wing ribs
Formed steel wire landing gear struts

AT-6 Texan — Scientific's semi-scale is famous trainer

■ One of the latest in the line of "very close to scale" models produced by Scientific Model Airplane Co. (Newark 5, N. J.) is the famous training plane that World War II flyers knew so well as the North American AT-6, or Texan. Same plane in Navy nomenclature was the SNJ. Though designer Walter Musciano has made some variations from exact scale, so that the kit is simpler to produce and to build, the appearance is surprisingly lifelike.

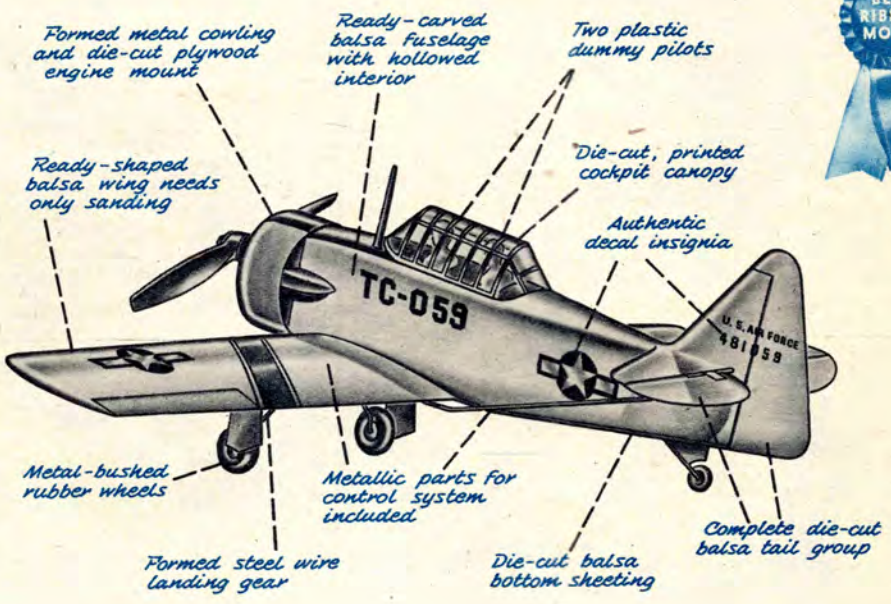
The fuselage is a semi-finished block of balsa about 6½" long, which is hollowed out and rounded on the upper surface. The undersurface is cut to hold the wing at the proper angle, and there is a flat area at the tail for the stabilizer. Correct incidence of the flying surfaces is thus assured. The fuselage has plenty of room for a fuel tank. The engine is held on a three-ply hardwood firewall, punched for the Cub .074 engine, which is mounted in an inverted position with the needle valve extended.

The landing gear wire is completely shaped, and wheels are 1" diameter rubber with metal eyelets for smooth running. There is a tiny 3/8" diameter rubber tail wheel, also eyeletted.

The single sheet of die-cut balsa carries parts for the tail surfaces, the fuselage underside, landing gear fairing, etc. The two elevators are joined by a hardwood dowel, and the kit includes an aluminum control horn, aluminum bellcrank, and all parts and instructions for installation of the Walker U-control system.

The wing is a single piece of 3/16" thick fairly hard balsa, milled to airfoil shape and cut to planform. A little sanding on tips and leading edge will ready it for use.

The kit features a full set of finishing products, such as Air Force insignia, a sheet of lettering decals, two plastic pilots, and a sheet of clear plastic for the "greenhouse", which has a realistically printed framework. The small plan sheet gives a full-sized side view of the model, with assembly and decoration sketches, and instructions. The plane can be flown with engines from .035 to .074 displacement.


Formed metal cowling and die-cut plywood engine mount
Ready-carved balsa fuselage with hollowed interior
Two plastic dummy pilots
Ready-shaped balsa wing needs only sanding
Die-cut, printed cockpit canopy
Authentic decal insignia
TC-059
Metal-bushed rubber wheels
Metallic parts for control system included
Complete die-cut balsa tail group
Formed steel wire landing gear
Die-cut balsa bottom sheeting

Meet Rodolfo G. Carlstein and his stunt model from Buenos Aires

Captivating Charmer from Argentina!

NANCY

■ *Nancy* is the fourth in a series of Half-A models based on the idea of combining performance with structural strength. Half-A models normally fly much slower than do larger stunters. This perhaps is the prime reason they are better able to withstand the inevitable mineralogical explorations which seem to plague even the most carefully designed and flown models.

Construction-wise, *Nancy* is quite simple if the following building procedure is followed.

Start with wing. The main spar carries the stress of the entire model so choose a piece of hard straight-grained ⅛" balsa. Mark off all rib locations and pin spar flat to your building board. Cement forward halves of the ribs and the false ribs in place and add leading edge; do not sand it to shape at this point. After allowing sufficient time for cement to dry thoroughly, remove it from board and add the rear rib halves and trailing edge. Install bellcrank. Sand leading edge to shape and add the 1/16" sheeting. Note that both spar and ribs are capstripped on the lower surface. Install lead-out wires and push-rod. Cover wing with lightweight Silkspan but do not dope it. Add the plywood tip plates.

The fuselage is built around a center keel which makes for simple wing-fuselage alignment and easily doubles fuselage strength. Use hard ⅛" sheet for the keel and see that it fits snugly on the wing. Cement it in place directly over the center rib of the wing. Cut out the wing as shown and trial-fit the fuel tank. The engine mount and all formers except the firewall are made in halves as shown.

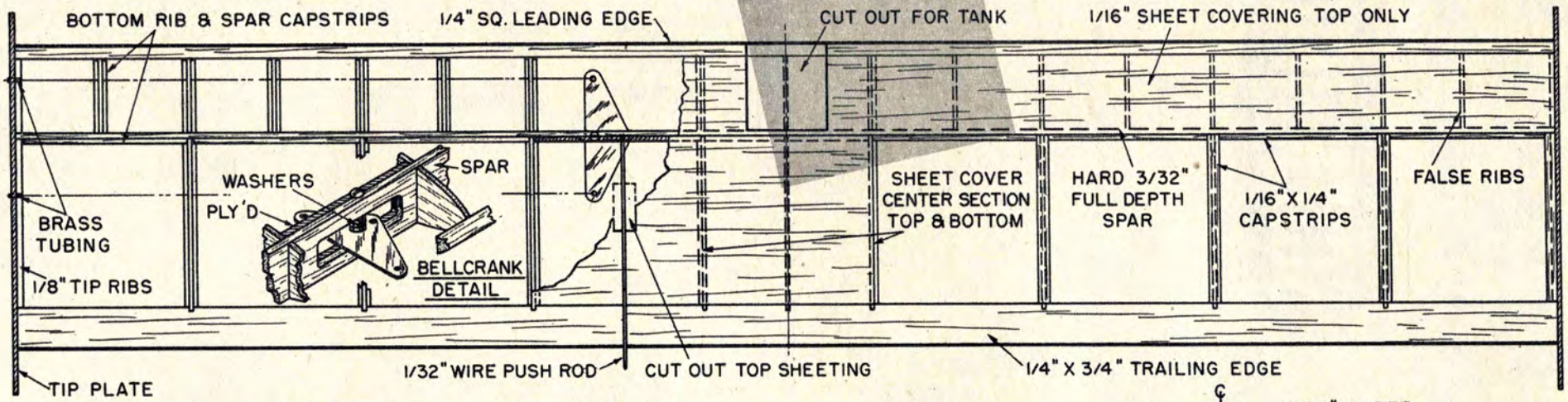
Cement the engine mount (1A) to the keel and the firewall with nose gear attached to the mount. Add the remaining formers and then the sides. Install the fuel tank and cover the top. The rudder may be solid or built up as shown. Install the main landing gear, fuel overflow tube and cover the bottom. The engine cowling is carved from soft balsa and hollowed out as necessary for engine clearance. Cement the stabilizer in place, make certain that it is at zero incidence and aligned horizontally with the wing.

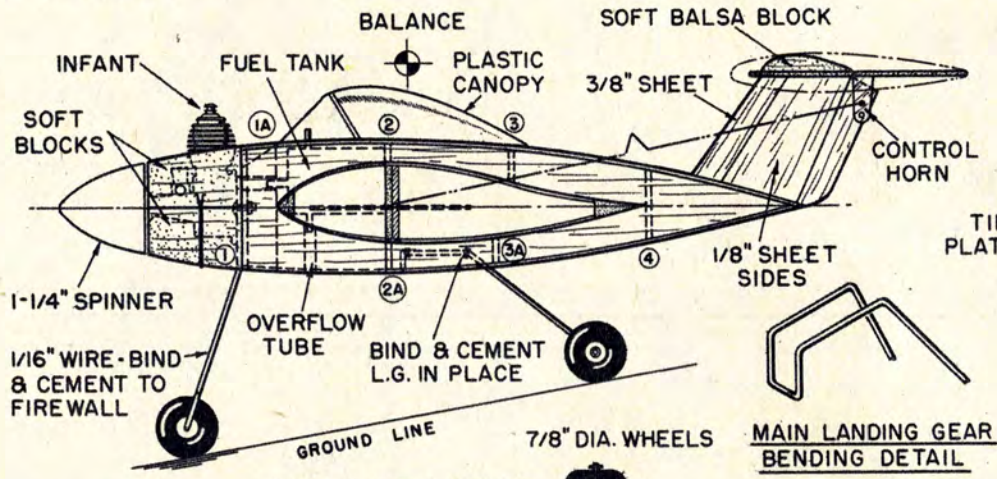
Apply at least two coats of clear dope to the wing and one or two coats of sanding sealer to all exposed balsa parts before color doping. If fuel-proof cement and dope were not used during construction it will be necessary to apply fuel proofer to the entire model, with special attention given to the areas around the engine and fuel tank.

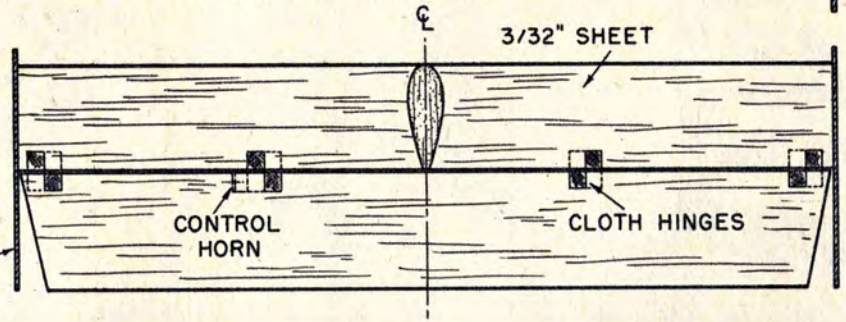
Nancy is a very steady flyer, but very responsive to control. Be sure that the engine is really revving before attempting an overhead eight or wing-over. Though the model flew very stably in windy Buenos Aires ("Good Air"), choose a calm day for the trial flight.

One last recommendation: refrain from employing your competition vocabulary in *Nancy's* presence, for she is a lady and will react as such.

Rodolfo strolled into our office with "Nancy" during a stop-over in New York City while on a trip from Buenos Aires to Switzerland. He had traveled by air from Argentina holding the little stunt model in his lap to insure safe delivery! RGC is 17, a 4th year student at St. Andrew's Scot School. He says there are 7 hobby shops in Buenos Aires and 12 in all Argentina. About 10,000 modelers are active in his country; 400 of them as members of the Club Aeromodelista de Buenos Aires. Rudy started modeling in '44, has designed 35 stunt jobs.


BOTTOM RIB & SPAR CAPSTRIPS
1/4" SQ. LEADING EDGE
CUT OUT FOR TANK
1/16" SHEET COVERING TOP ONLY
WASHERS
PLY'D
SPAR
BRASS TUBING
1/8" TIP RIBS
BELLCRANK DETAIL
SHEET COVER CENTER SECTION TOP & BOTTOM
HARD 3/32" FULL DEPTH SPAR
1/16" X 1/4" CAPSTRIPS
FALSE RIBS
TIP PLATE
1/32" WIRE PUSH ROD
CUT OUT TOP SHEETING
1/4" X 3/4" TRAILING EDGE


BALANCE
SOFT BALSA BLOCK
INFANT
FUEL TANK
PLASTIC CANOPY
3/8" SHEET
SOFT BLOCKS
CONTROL HORN
1-1/4" SPINNER
OVERFLOW TUBE
BIND & CEMENT L.G. IN PLACE
1/8" SHEET SIDES
1/16" WIRE - BIND & CEMENT TO FIREWALL
GROUND LINE
7/8" DIA. WHEELS

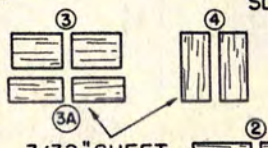

3/32" SHEET
CONTROL HORN
CLOTH HINGES
TIP PLATES

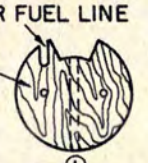
MAIN LANDING GEAR BENDING DETAIL

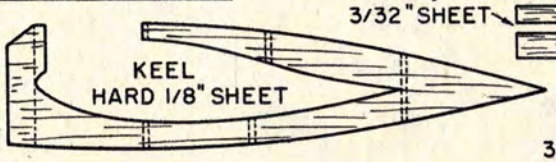
WING TIP PLATES 1/16" PLYWOOD

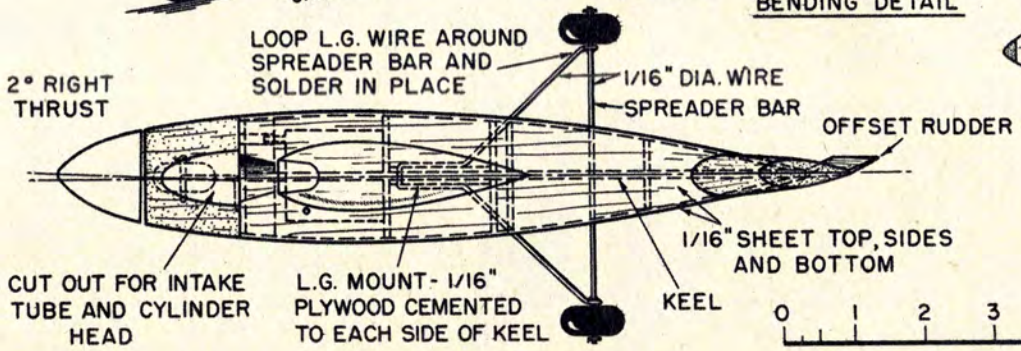
STABILIZER TIP PLATES 1/32" PLYWOOD

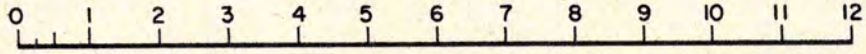
WING RIBS 1/16" SHEET


3/32" SHEET


SLOT FOR FUEL LINE
1/16" PLY'D
TAPER
3/8" SHEET
KEEL


KEEL
HARD 1/8" SHEET


2° RIGHT THRUST
LOOP L.G. WIRE AROUND SPREADER BAR AND SOLDER IN PLACE
1/16" DIA. WIRE
SPREADER BAR
OFFSET RUDDER
1/16" SHEET TOP, SIDES AND BOTTOM
CUT OUT FOR INTAKE TUBE AND CYLINDER HEAD
L.G. MOUNT - 1/16" PLYWOOD CEMENTED TO EACH SIDE OF KEEL
KEEL


0 1 2 3 4 5 6 7 8 9 10 11 12

Winners

AMERICAN BOY STUNT TRAINER

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NEW!

18" WINGSPAN FOR
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Introducing our BRAND NEW U-Control trainer . . . the biggest dollar's worth of model airplane in the whole wide world. BEGINNERS . . . here's your kind of model! It's an exciting profile job that's A CINCH TO BUILD . . . EASY TO FLY. It's 100% complete . . . 100% prefabbed. Assemble it in "nothing flat," add your engine — and away you go! EXPERTS . . . you'll love this inexpensive model for your experimental work—for testing new flying techniques. Imagine . . . only $1.00 for this beauty. See it soon at your favorite hobby shop. The kit comes complete with every single prefabricated part, Jim Walker's U-Control, etc., etc.

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AIR TRAILS BLUE RIBBON MODEL

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You'll love this BRAND-NEW control-liner. It's an authentic scale replica of the world famous U.S. Air Force AT6 Trainer. The Navy calls it their "SNJ." In model form it's a real "thriller." The completely prefabricated kit includes: Jim Walker's U-Control, carved balsa fuselage, formed balsa wing and tail assembly, formed metal cowling, hardware, decal, wheels, etc., etc.

$1.95

CURTISS Hawk P6-E

17½" WINGSPAN FOR
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This deluxe Scientific model is an authentic replica of the U. S. Army's famous "Hawk" fighter. The control-line model lives up to its prototype in both flyability and appearance. The 100% complete kit is precision prefabbed for easy assembly — includes: Jim Walker's U-Control, carved balsa fuselage, formed balsa wing, struts and tail assembly, rubber wheels, 3-color decals, etc., etc.

WACO CABIN

FOR .020 TO .049 ENGINES

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Exciting action! Here's our sensational model of the ever popular Waco Cabin. The authentic semi-scale model brings to life one of America's most beautiful private bi-planes. The prefabricated kit contains many of the features you'd expect to find on models costing dollars more. Included: Jim Walker's U-Control for small bore engines, completely carved balsa fuselage, formed balsa wings and tail assembly, struts, decal, hardware . . . plus many, many more big quality extras.

BE SPECIFIC SAY—

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FIRST in Performance

MONOCOUPE

NEW!

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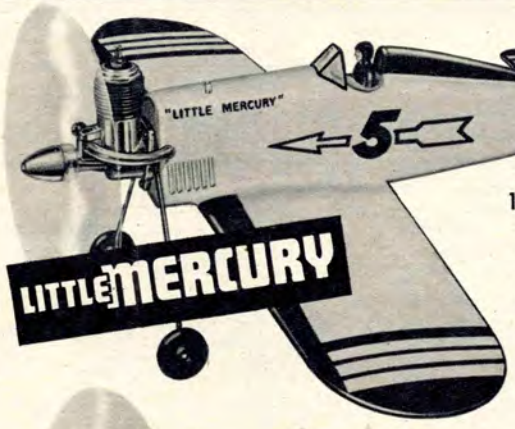
BEGINNERS . . . come join the control-line flying "parade" with this BRAND-NEW scale model of America's favorite private plane. It's specially designed so that it's EASY TO BUILD . . . EASY TO FLY. The completely prefabricated kit includes: completely carved balsa fuselage, formed metal cowling, Jim Walker's U-control, formed balsa wing, etc.

$1.50



LITTLE MERCURY

$1.50

18" WINGSPAN FOR .039 TO .074 ENGINES

Sensational! Here's our snappy LITTLE MERCURY . . . an extremely popular model with the U-Control fans. The completely prefabbed kit features: carved balsa fuselage, shaped balsa wing, Jim Walker's U-Control, hardware, etc.

bel-air

18" WINGSPAN FOR .039 TO .099 ENGINES

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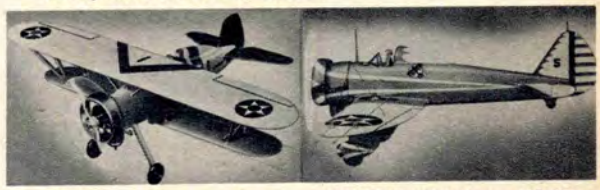

BOEING F4B-4 $2.95

SPAN: 17½" For .020 to .074 Eng.
Brand new deluxe U-Control model. 100% complete with carved balsa fuselage, wings, etc. A real 'honey'.

BOEING P-26A $2.95

SPAN: 18" For .020 to .074 Eng.
An excellent control-line flyer. Prefabricated kit is complete in every detail . . . all parts finished.

LITTLE BIPE $1.50

SPAN: 16" For .020 to .074 Eng.
Carved balsa fuselage bi-plane . . . prefabbed for easy assembly. It's control-line. A real value!

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SPAN: 18" For .020 to .074 Eng.
An economically priced U-Control model. Prefabbed parts include: formed balsa fuselage & wing, etc.

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SPAN: 18" For .020 to .074 Eng.
Famous escort fighter model. Completely prefabbed. Features carved balsa fuselage, formed balsa wing, etc., etc.

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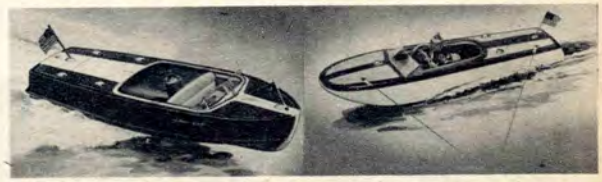
LENGTH: 9" For "½ A" Gas. Eng.
Speeds over 40 m.p.h. Features direct wheel drive. Prefabbed kit has formed body, rubber wheels.

PIPER CUB $1.95

SPAN: 22" For .020 to .074 Eng.
A U-Control scale replica of the real plane. Prefabbed model has metal cowl, carved fuselage, etc.



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LENGTH: 14" For .020 to .074 Eng.
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"½ A" Eng., CO_2, or Elec. Motors
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"½ A" Eng., CO_2, or Elec. Motors
Prefabbed. Has a 12" carved balsa hull, brass metal fittings, etc. Aeronautical fin and rudder design.

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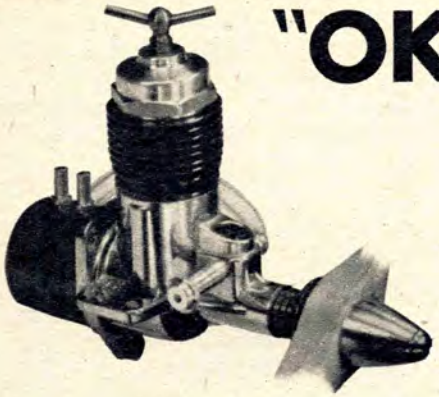
"OK" Cub Diesel



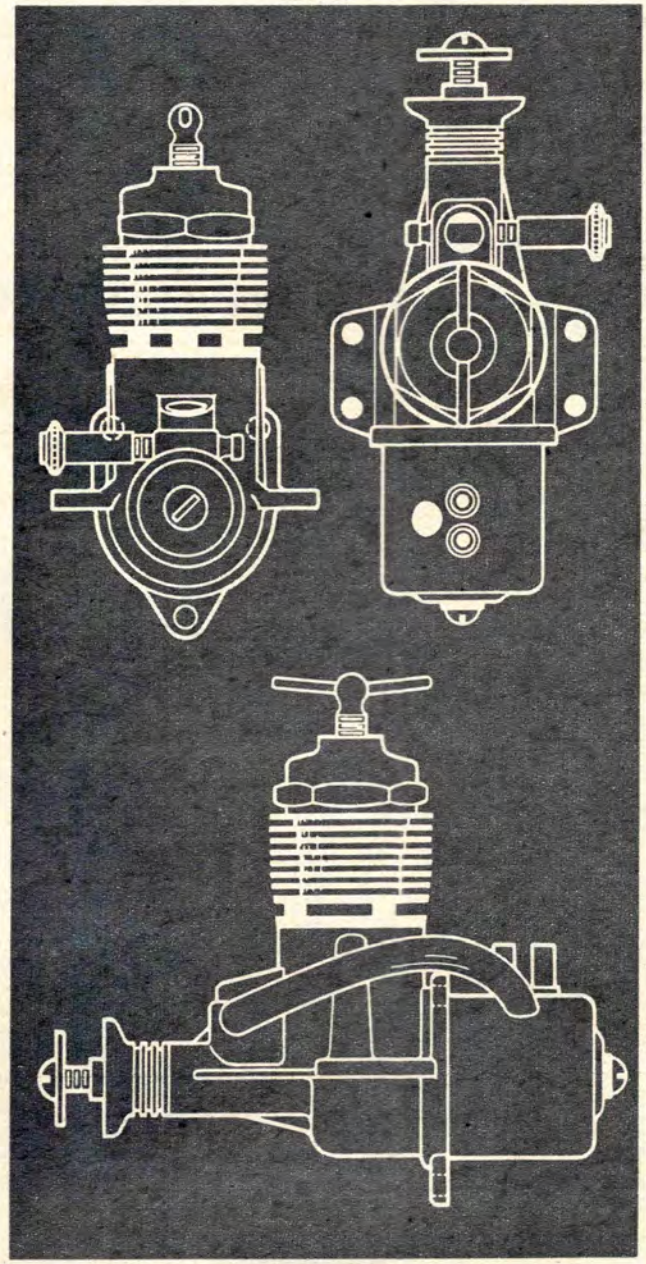
Herkimer's new compression ignition powerplant provides performance plus

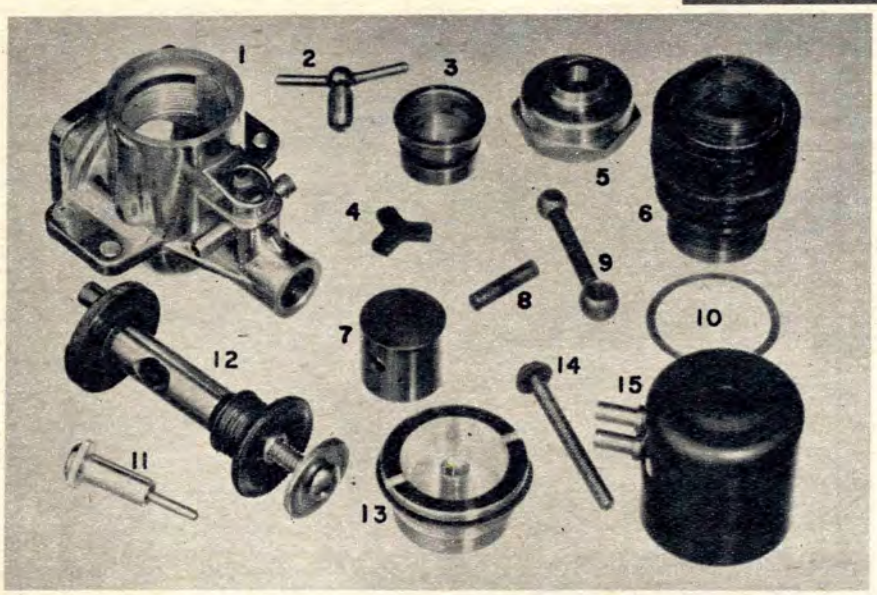
■ The Herkimer organization is excited about its new Cub Diesel, and according to our observations they should be. Model diesels were long known as long-stroke, heavy, slow-speed engines. Parts were made oversize to resist the hammer and knocking that occurs when the engine runs lean. Herkimer solved this problem in an entirely different and unique way. They placed a spring or "shock pad" in back of the contra piston so that the shock caused by knocking is absorbed in the head rather than being transmitted to the piston, wrist pin, connecting rod and crankshaft. With the hammer and shock eliminated all moving parts can be made much lighter, and lighter speed with less vibration is the final result.

Actual tests show that all benefits announced are legit. When the Cub Diesel is adjusted lean the knocking can barely be detected. Needle valve adjustment is as broad as with a glow plug engine.

Internal construction is very good for the high compression encountered in "diesel" operation. The piston is hardened steel ground to an excellent finish. A solid steel wrist pin is used for extra strength. The connecting rod is hardened steel and provides a wear-resistant bearing surface at both the crankpin and wrist pin. Hardened steel is used for the crankshaft; the bearing surface is ground.

Compression adjustment is controlled by a small machine screw in the cylinder head. This screw contacts the spring steel shock pad which rests in a recess in the top of the contra piston. Compression is sealed by a plastic ring inserted in a groove cut in the contra piston. A very close fit is maintained between (*Continued on page* 62)





1. Crankcase: aluminum die casting, .48 oz.
2. Compression adjusting screw: steel, 8-56 thread, .06 oz.
3. Contra piston and seal: steel-plastic seal, .478" dia., .14 oz.
4. Contra piston spring: tempered steel, 1/16" thick, .02 oz.
5. Cylinder head: aluminum, .09 oz.
6. Cylinder: steel, 1 1/16" long, .52 oz.
7. Piston: steel-hardened and ground, .4785, .13 oz.
8. Wrist pin: steel, .109" dia., .02 oz.
9. Connecting rod: hardened steel, 13/16" long, .05 oz.
10. Cylinder gasket: copper, .05" thick.
11. Needle valve: steel and alum. .02 oz.
12. Crankshaft: steel-hardened and ground, 1/4" dia. shaft, 1.40" dia. crank pin, .26 oz. Drive washer: alum., 19/32" dia., .06 oz. Propeller washer: steel, 15/32" dia., 03 oz. Propeller screw: steel, 5-40 thread, .03 oz.
13. Crankcase rear cover: aluminum, .11 oz.
14. Fuel tank screw: steel, 3-48, .02 oz.
15. Fuel tank: alum., 27/32" x 7/8". .11 oz.

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G17 Thunderbolt P-47, 1.00

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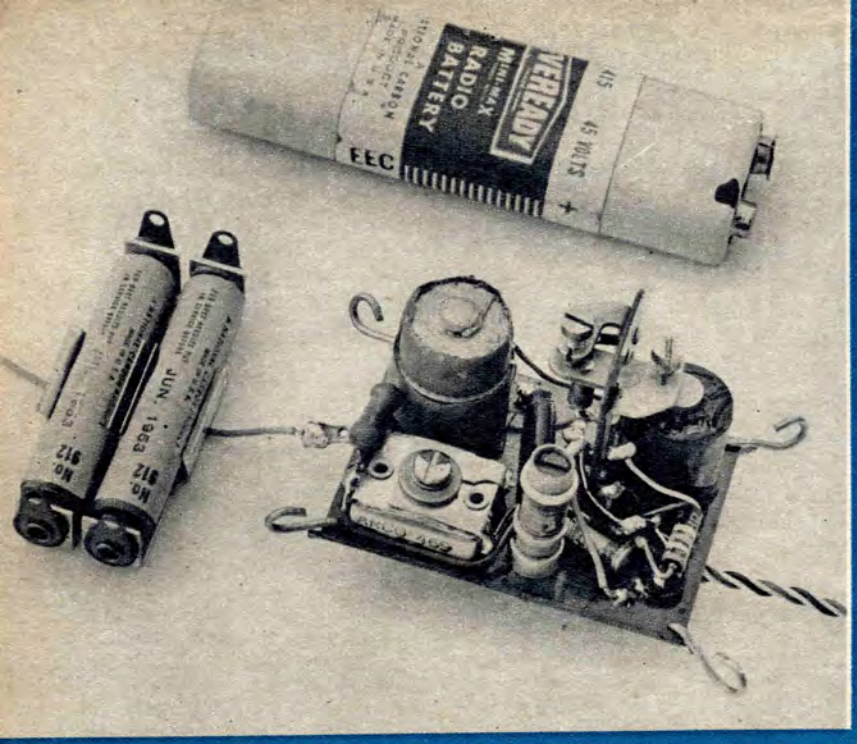


Shown just about actual size are Mini-Mac and Eveready's small 45 volt "B" battery, a new Mini-Max model. Quite a savings in weight!

Mini-Mac

HARD TUBER

Simplest thing in non-gas type receivers is this new rig by the old master. Sub-miniature CK526AX is dilly

By HOWARD G. McENTEE

■ Since our Simple-Single was introduced in Air Trails last July, a lot of flyers have tried it, most of them with good results (yep—there have been some questions, too; more on this later). Even though the power drain, especially that of the filament, is lower than on any comparable hard tuber, it is still a bit high, when using the smallest-sized batteries that are required for R/C planes in the Half-A category.

So we set out to reduce filament drain, by employing one of the sub-miniature tubes that are so tiny and economical, and when one was found that would do a nice job, it seemed a shame not to go all the way, and produce a sub-miniature receiver to go with it. The result is shown here; the little set measures only 1½ x 1½ x 2⅛" overall, and weighs just over 2 oz., with power cable and battery plugs. The size could be cut even more, and the receiver mounted in a tiny box with the relay separate, as suggested by George Trammell in the Dec. issue. Made to the size shown, though, it will fit in most any plane, and is still large enough so that you won't get the "screamin' meemies" putting it together.

The usual 1/16" linen bakelite "chassis" is utilized. Cut it to the size shown and drill all the holes. The end lugs are cut off the trimmer condenser C2, and it is mounted by the two little tabs near the center. The tube socket is held only by its solder lugs; bend them as shown in the sketch, and bring up a lead to the grid lug.

The ESSCO quench coil is the smallest one we could find, and it is used here without the large bakelite lug plate that is normally attached to it. If yours has the plate, remove it, first unsoldering the four coil leads. Don't bother to mark them, as the diagram will show where they go. Cut the center tubing down to about 1/16" on each end. A 3/16" hardwood dowel is a snug fit, and is held in with model cement; before you insert this dowel, bore a hole in one end, to make it easier to run in the little brass screw that holds the assembly to chassis; don't use longer than a ¼" screw. A word of caution—*don't* use a machine bolt through the coil to hold it in place, as it will cut sensitivity down quite a lot.

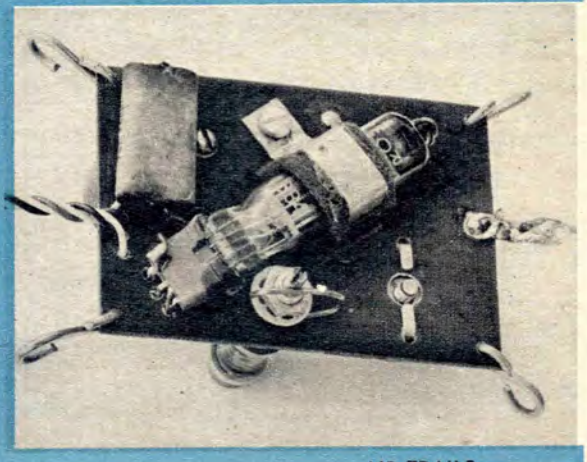
We used two little eyelets (A and B on the diagram) to hold down loose wire ends, and a rivet-type lug is needed for the antenna connection. After these items were installed, all other parts were mounted.

To forestall trouble, we advise making the RF coil L1 on the specified form, so you will be sure you can hit the 27¼ mc. spot. Place the winding on the form as shown, to insure that the iron slug will tune properly. So that the slug-threaded shank does not project so far, the slug is placed on the upper side of the winding—that is, the end away from the chassis. A length of 1/32" music wire is held under the coil mounting nut, and bears strongly against the slug shank, to hold the setting under vibration.

The RF choke we used is a commercial one, but can be made as shown on the drawings, if you wish. Don't use one with larger wire or a shorter form—it will not work well, if at all. A coat of *thin* dope over both the choke and L1 turns will hold them in place.

Before firing up the receiver, we suggest that builders go back and read the Simple-Single story in the July and August issues. Practically everything said there applies to this receiver, so it's not necessary to repeat here. However, there are some points we again stress, for we feel that those who have trouble

The chassis drawing at the far right and the receiver photo here are both actual size! You can see how small a space is required in the model to accommodate your Mini-Mac. Kits of parts will be available from several supply sources if you don't have a well-stocked parts box yourself or are situated without radio supply store around the corner. Let's see pictures of your installation when you've completed it.



with single hard tubers just do not understand them well enough—possibly because they have been used to gas tube receivers, which behave quite differently.

In the first place, hard tubers have to be set for sensitivity before they can be used; you have to turn the sensitivity control (C2 in this case) till the plate current drops abruptly, then unscrew the trimmer till the current jumps back up to the normal idling point again. *But don't fly with this setting!* Back the trimmer off still more, to get the receiver stability you must have to fly safely; in the Mini-Mac, a further quarter turn is about right. This receiver should idle at about 1.8 ma.; if the idling current is higher than this, it is wise to try another grid leak (R) to get the current to the point specified. As battery voltage drops the idling current might go down to as low as 1.5 ma. The resistor R we used is marked 390,000 ohms, and measures very close to this, but standard tolerance for carbon resistors is plus or minus 10%, so your resistor could be anywhere from 350 to 430 thousand ohms.

All right, have you got the idling current and sensitivity control all set? Now—and not before—is the time to try the receiver with a signal. A strong one will drop the plate current to around .35 ma., and a weak one to about .6. Of course, the final test is to take the receiver out into the field, get about a quarter to a half mile from the transmitter, and *then* see how the current changes. It will sometimes be found that the receiver works poorly, or not at all right near a transmitter running full blast. This is normal, and is called "overloading." Just get a little farther away. Tuning of the core should be done at least several hundred feet from the transmitter, and preferably at much greater distance. Remember—fairly close to the transmitter, most anything goes. It is when you get your plane out at a half mile or so that you want the tuning to be *right*.

Since the average plate current change of the Mini-Mac is about 1.7 to .5 ma., the relay can be set to pull in at around 1.3 ma., and drop out at .9; this setting was found to be quite possible with the E.D. relay we used. All these tiny relays require some care in mounting, to protect them from excessive vibration, since they just can't be set with the spring tension that you would be able to use with a Sigma, for example. You can use any other relay you want, of course, but if the coil resistance is higher than 5000 ohms, the plate voltage should be raised, to keep the idling current at about 1.8 ma.

The filament of the CK526AX draws only 20 ma., so even a pencell filament supply will give quite a long life. Because of this low filament current, the plate current should never be allowed to go over 1.8 ma.

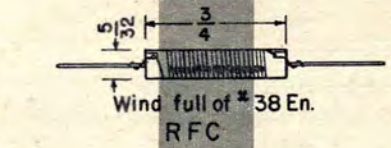
Operating Hard Tubers

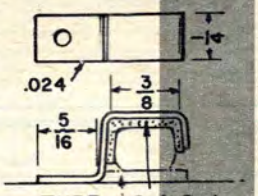
As noted in the first paragraph of this article, hard tubers have caused some troubles; we feel these are due solely to the fact that the users do not understand them. Here are a few points that you should remember:

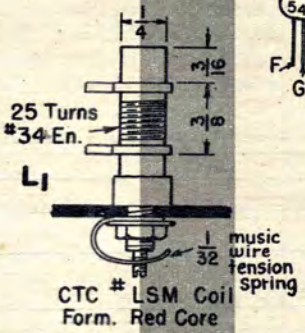
1. Always be sure your sensitivity control is set correctly. After the receiver and other equipment have been mounted in the plane, become thoroughly acquainted with the operation of this control before you fly the plane. The sens. control should be unscrewed as far as possible from the point where the plate current pops back up (with no signal), while maintaining sufficient sensitivity to operate the receiver at the maximum range you want to fly. Of course, reception in the air is likely to be a bit different than on the ground, but it will probably be better, if anything.

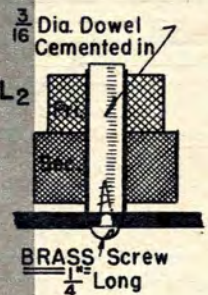
2. If you find the sensitivity control has to be screwed up tight to get the plate current drop (with no signal) it indicates too much antenna is in use. Cut the length a bit, or use a smaller capacity for C1. Two feet of antenna should be plenty for any case; in a large plane, where there is a lot of lengthy wiring, this may be too much.

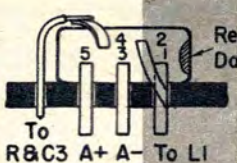
3. If the plate current drops as it should with signal, but will not come back unless you touch the antenna, or bring your hand near it, back off on the sensitivity (*Continued on page* 75)





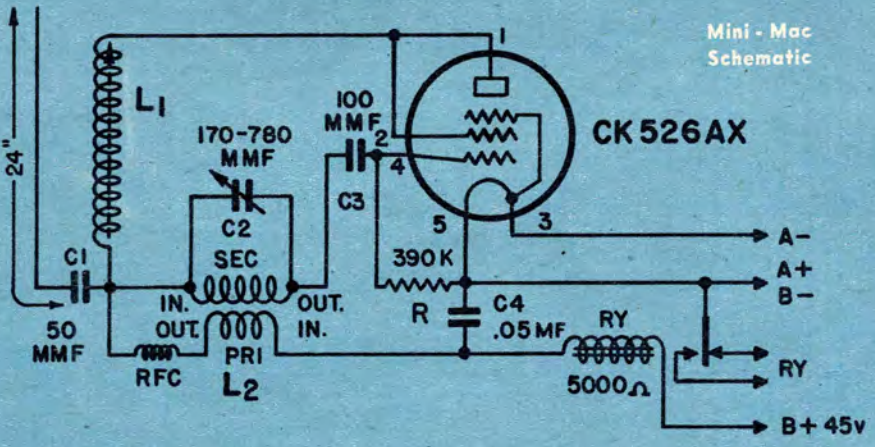




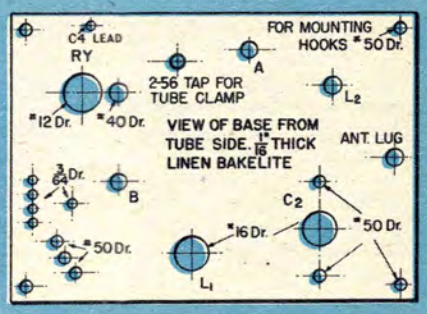


BENDING SOCKET LUGS 1 & 2 Soldered Together. Go through same hole

Mini-Mac Schematic



Full-size chassis



R/C at the

■ The official tabulation showed that there were 141 entries, and that a total of 217 official flights were recorded. There must have been at least 75 modelers at the meet with planes. While the majority of these intended to fly, only about three-quarters of them did so; 36 managed to make a score of some sort.

In point of weather, organization, quality of flying, judging, and all other counts, it was the most successful yet.

Director deBolt figured there would be time for about 500 official flights. Thus, the 4-minute time limit on getting a plane out on the runway and into the air after a name had been called, and the 8-minute limit on the flight itself were strictly enforced.

The grade of flying was very high. Needless to say, the multi-control boys put on a spectacular show; to those used to flying rudder-only planes, it just doesn't look right to see an R/C ship flying along level, then turn abruptly straight down for a screaming dive. Or roll along the runway on take-off, then jump into the air just as the edge approaches, when elevator is applied. We saw some very creditable upside-down flights, and deBolt showed us some nice outside loops, with his symmetrical-wing plane.

All in all, the multi-control flyers put on the most thrilling demonstrations, yet the rudder-only boys did quite well. It takes a real effort to beat a good rudder plane, flown by a modeler who knows his business. Among those who made official scores, there were about 10 planes with three controls; most of the others had just plain rudder. Seven of the top ten were single control operators.

There were few really bad crack-ups, and not too many fly-aways. Many, however, were the complaints of interference. Anticipating this, we had taken along the little Direction Finder (re-described in the new A.T. Model Annual, '54 issue) and it was kept very busy every time a contestant called out that he had interference.

One flyer on 50 mc. turned on his receiver to make an official flight and found the plate current way down, indicating a steady carrier on the air. The D.F. was steamed up, and sure enough, there was a good steady signal, upon which we took a nice "fix." Since the Finder gives a line—the signal might be in either of two directions—the flyer himself took off toward the free flight event, while Director deBolt headed in the opposite direction, both intent upon finding the "pirate." While they were gone, the flyer's "ground crew" snooped around a bit and found that the plate by-pass condenser on his receiver—which was still turned on—had broken loose. The receiver thus was not supering, but acting like a miniature transmitter, and this was the signal we were picking up! We were pleased to note that our first check on the "interference" had indicated a direct line to the offending plane, from about 75 feet away.

The continuous use of this D.F. at the Nats shows that such a piece of equipment is going to be a must at future meets. Not only is it ideal for locating actual interference, but is a valuable psychological factor as well; it was noticeable that following continuous cries of interference during the first few days of flying—and total lack of such signals, when we checked with the Finder—the flyers soon began to realize what they would recognize if they were not flying under contest pressure—namely, that we all tend to yell interference as soon as our R/C equipment becomes erratic in the air. In most cases it turns out to be radio bugs, pilot jitters and the like.

As is usually the case, the kit planes predominated, with magazine article jobs and originals numerous. No one paid too much attention to Jack Port and his very clean new design, till toward the end of the meet, when it became evident that he would be very near the top of the winners' list. After Jack had made one perfect take-off after another, we began to realize that he had a special design of landing gear; the rear wheels of the trike gear are in front of the C.G., so the plane sits back on them and the tail skid when at rest. As soon as the plane is released for take-off, engine pull rocks it forward on the nose wheel, and it rolls along the runway as though on rails; when flying speed is attained, the nose wheel comes off again, and the ship is under full rudder control.

Take-off problems plagued a large portion of the planes at the meet. The trike gear boys did the best; many of the two-wheelers exhibited vicious ground looping tendencies. It's apparent that those who wish to stick to two-wheel gear will have to shove the wheels way back under the leading edge of the wing, if they want to be assured of good ROG characteristics.

Another brand-new design with trike gear was that flown by Walt Good; it did fine on ROG, and very well in the air too. Intended as a rugged sport and contest ship, it surely proved to be just that, when it dove into the runway from a hundred feet up, with engine wide open. There was damage, of course, but the plane did not disintegrate, as many others would have, and was back flying again later in the week, exhibiting some pink patches, but following the pattern as well as ever. *P.S.*—a broken wire in the transmitter caused the crash! Air Trails will carry full plans for this plane, as well as for Jack Port's winner.

One of the most unusual R/C planes we have ever seen was Jim Reed's gigantic biplane; he had built it as a weight carrier, to compete in F.A.I. endurance trials. Engine trouble prevented it from doing much, though it did skim over the runway on its best attempt. He has since had it flying very nicely.

Earl Vivell (remember those Vivell engines?) had a bevy of fiberglass planes at the meet. One of these was completely covered with this material, and had an Elf 6-cylinder engine in the nose! Earl made a try at flying one of the planes which had a conventional wing, but it rolled in shortly after take-off; it did prove that the material could take punishment, though, for the fiberglass was little damaged.

One radio controller who is attempting to interest R/Cers in operation on other frequencies is John Hamblen of the DC/RC. John had several very nice flights with his plane, the radio equipment of which is on 220 mc. He uses a four-tube receiver, and an audio tone system. The transmitter is made mostly of surplus parts, and is compact and of low power. Most of the A.F. tone rigs of this sort operate with carrier on all the time; pulses for the rudder come when the audio tone is keyed on and off. John accomplishes the latter by simply switching the filter of his vibrator power supply in and out of use! Simple, logical, and it works fine.

The only use we could find of that new little wonder, the transistor, which will doubtless be widely used in R/C within another year, was in the "scale model" of a Rudderbug, built by Steve Eros. The plane itself is an exact half-size copy of the Bug, and a very nice flyer. His receiver uses a sub-miniature tube as oscillator, with the transistor following, to work the relay. The arrangement seems quite practical, though Steve notes that it is necessary to add a pot. in the transistor battery circuit, since these units are affected by temperature, and the adjustment of the pot. helps keep the current at the desired level.

On display at the meet was the fabulous speed plane built by West Coaster Bill McKerracher. Bob Beckman had brought it along with the idea of trying to better the speed the plane had previously achieved, and one attempt was made to get it into the air, but the engine refused to perk as it should and the ship did not get off the ground. To quiet the scoffers, though, the Coast flyer had brought along several movie films, which were run off for a large gathering of those interested in R/C. One film showed the speed plane in action. Another—and this one seemed

NATIONALS

really to excite the radio builders present—showed the R/C boats that are in constant use on the West Coast; most of these boats are quite large and carry multi-control equipment of the Rockwood type. We saw fast cabin cruisers, paddle-wheelers, a tugboat with working steam propulsion, etc. Many an R/C flyer departed from the film showing with a resolve to have a try at this R/C boat business.

There were the usual ingenious "combination control systems" where several controls can be operated over a single R.F. channel, and without the use of multiple reeds or audio filters. For example, Lou Andrews had rudder, motor and elevator control in his beautifully finished little Beam, all worked by escapements from a single 465 mc. receiver. Claude McCullough and Jack Williams had the same three controls, but their system is based upon pulse operation, the rudder being fully proportional. They also have worked in fail-safe features, to cover loss of control should there be a transmitter failure, or should the plane fly out of range. Phil D'Ostilio has two receivers and transmitters operating on the amateur 50 mc. band; one R.F. channel controls the rudder, while the other can be used for either motor or elevator, depending upon how connections are made before the ship is launched.

Some of the operators who use multi-controls actuated by reeds favor motor-driven servos that give only a single degree of surface movement, with a self-centering feature when the signal is off, while others like to have what they call "trimmable" control—that is, the surface can be moved to any angle and will stay there till it is moved again by operator. Sewell and Regalia used the latter system on their elevators, while Bonner and Curry had self-centering elevators, since they used escapements to move all surfaces.

The latter two flyers incidentally used tuned audio filters in their receivers, in place of the reeds favored by all the others who had selective audio control. They feel that the filters are a lot less fussy than the reeds; there is a disadvantage, though, in that each audio channel requires an extra tube in the receiver. Since they use only two tones this is not of great consequence, but it would get cumbersome in the five-tone style of control used by other audio advocates at the Nats.

We list here a tabulation of most of the flyers who had planes at the Meet, whether they flew or not. Many of them did fly, but did not make an Official Score. Sad to say, we couldn't grab all of them to fill out our data sheets, but those we have should furnish valuable information for our readers. It is most interesting to compare wing loadings, motors and props used, types of planes most favored, and so on. We estimate that we have been able to list about 75% of those who actually had planes at the meet; to those who filled out our forms —a big thanks.

R/C Flyers Who Had Planes at 1953 Nationals

All flyers were on 27.255 mc., used quarter wave vertical ant. and push-button, unless otherwise noted. All 465 mc. equipment is Citizen-Ship with about 2 W. input to trans., and C-S receiver. All 2-tube receivers are similar to those developed by Control Research, using one gas tube as osc., and a relay tube, except as noted. Data is omitted on well-known commercially made or magazine-article R/C equipment. Area and span of standard kit and article planes as follows: Super-Brigadier, 466 sq. in. and 58"; Bootstraps, 350, 54; Live Wire Trainer, 432, 48; Live Wire Senior, 750, 65; Beam, 372 (effective), 50; Rudderbug, 850, 74; Robot, 576, 60; R/C Master, 480, 48; Rudolph, 590, 60.

Listed are flyer's name, ham call if any, home, age, number of years in R/C, club; plane with span, area and wing loading, and any modifications, engine and prop; style of control (pulse, escapement, reeds, etc.) and elements in plane that are under control (RME for rudder, motor, elevator), followed by receiver and transmitter data, form of control box, if other than button. Number at end of each paragragh shows place, if flyer made official flight score; T shows a tie.

FRANK R. ADAMS, Janesville, Wis., 32-1½, Janesville Tri-Nitro-Teers. Original, 46" span, 288 sq. in. area, 14 oz. wing loading. Cub .09, 9/3 prop. Proportional rudder. 2-tube rec., 5 W. trans. with electronic pulser. 6.

RICHARD C. ALLEN, Dayton, Ohio. 24-2, Springfield Strato-Hawks. "Hot Wire" (modified Live Wire with trike gear, thin fuse, long nose, high fin), 48" span, 432 sq. in. area. ED 15 diesel. 10/6 prop. Escap. on rudder. Controlaire rec. with CK5672 tube. Controlaire trans. with 6C4, 4W. T3.

L. J. ANDREWS, Norwood, Mass, 37-1½, Norwood Society of Model Engineers. Beam with 14 oz. loading. McCoy .09, 8/6. RME with Compound and motor control escapements. Citizen-Ship R/C equipment. 14.

LOU AULETTA, 28-1. Rudderbug, 17 oz. loading. 11/6 prop. Escapement on rudder. 2-tube receiver. 3A4 trans.

HERMAN BIRNBAUM, 26-5. Live Wire Trainer, non-removable receiver tray. McCoy .09, 8/6. Escapement on rudder. 2-tube receiver. Modified Mac II trans. with 3Q4 tubes.

VINCE BONNEMA, Clifton, N. J. 37-3. Original with 60" span, 580 sq. in. area, 16½ oz. wing loading. Cameron .19, 10/3½. Proportional rudder. 2-tube receiver. Mac II trans. with multi-vibrator pulser. 19.

HOWARD T. BONNER, Los Angeles, Calif. 36-4, L.A. R/Cers. Original with 78" span, 864 sq. in. area, 16 oz. loading. Fox .35, 11/6 prop. RME using one compound, one plain, one motor control escapements. Curry 2-tone audio band pass receiver. Curry trans. with .2 W. input, base-loaded whip ant. Two push buttons. 2.

H. M. BOURGEOIS, W4VJJ, Havelock, N. C., 32-5. Original plane with 54" span, 432 sq. in. area, 17.3 oz. loading. Cub .14, 9/3 prop. 4-position esc. on rudder. Own RK6I receiver. Own 50 mc. trans., 15 W. input, beep box.

JOHN H. BRANDT, JR., Springfield, Pa. 28-2, Golden Eagles R/C club. Berkeley kit model. Rudder and down elevator on escapement. E.D. receiver and trans.

WARREN L. CARTER, Norfolk, Va. 40-4, Norfolk Model Assoc. Mercury Tiger Moth scale model. Escapement on rudder. 2-tube receiver. Citizen-Ship 27¼ trans.

RONALD E. CHANDLER, Ottumwa, Iowa, 26-1, Hornets R/C club. Original model, 60" span, 1230 sq. in. area. 19.7 oz. loading. Fox .35, 11/4 prop. RME, brakes, ailerons. Pulse actuator and 5-pos. escapement. Modified Rockwood tone receiver. Rockwood transmitter. Cam pulser and 8-position beep box.

DONALD R. CLARK, Kensington, Md. 32-3, DC/RC club. Rudderbug with deeper fuselage. Rudder and engine cutoff on escapement. Good audio tone rec., original 3 tube trans. with 1 W. input Beep box T11.

FRED T. COLLINS, Pittsburgh, Pa. 32-4. Beefed-up Rudderbug, 20 oz. loading. Fox .59, 14/6 prop. Escapement for rudder. 2-tube receiver. 3A4 trans. with 4 W. input. Errington beep box. T26.

LEO C. CUNNIFF, W20EH, Clifton, N. J. 27-2. R/C Master with deepened fuselage, 22 oz. wing loading. E. D. Mark IV diesel, 9/6 prop. Proportional control on rudder. Own RK6I receiver. 3A5 transmitter on 50 mc., 4.7 W. input. Trammell electronic pulser. T16.

JOHN T. CURRY, Manhattan Beach, Calif., 44-3, Los Angeles Radio Controllers. Same plane and engine as Howard Bonner, but 18 oz. loading. Same radio and control equipment as Bonner. 5.

JACK CURTIS, 37-1. Live Wire Trainer. Rudder on escapement. 2-tube receiver. Aerotrol trans., beep box.

CARL DEUTSCH, Woodbridge, N. J. 43-1. Robot. Rudder with escapement. 2-tube receiver. 4 W. input transmitter with beep box.

PHIL D'OSTILIO, W1THC, Fairfield, Conn. 30-4, Bridgeport Aeronuts. Original plane with 59½" span, 540 sq. in. area, 17 oz. loading. Arden .199 with 9/4 prop. Rudder, elevator or motor with escapements. Two Control Research receivers on 50.0 and 53 mc. Own double-channel transmitter with 3A5 and 3B7 tubes, folded dipole antenna. 8.

LEO M. DUBOIS, Hyattsville, Md. 25-1½, DC/RC club. Super Brigadier with extended nose. Wing loading, 17 oz. Cub .14 with 9/5 prop. Rudder with escapement. A.T. Annual receiver and trans. modified. 3A4 tube with 2.4 W. input. Beep box.

STEPHEN EROS, Cleveland, Ohio. 37-5, American Airlines Gas M.C. Half-scale Rudderbug, 34" span, 200 sq. in. area, 12 oz. loading. Wasp with 7/3 prop. Rudder with escapement. Own receiver with CK522 oscillator and 1N33 transistor for relay. Own transmitter with 5618 tube, 4.5 W. input, and 5 ft. whip ant.

WALTER GOOD, Bethesda, Md., W3NPS. 37-17. DC/RC club. "WAG" original with 60" span, 660 sq. in. area. 16 oz. loading. Forster .29 with 11/6 prop. Rudder with 4-arm escapement. Own 3-tube audio tone receiver. 3-tube transmitter with .7 W. input. Beep box. T3.

MICHAEL GRANIERI, Newark, N. J. 34-5, Guided Missiles R/C club. Original plane, 60" span, 450 sq. in. area, 25 oz. loading. Torp. .19 with 9/4 prop. Rudder with escapement. Own 2-tube receiver. Own transmitter with 6AG5 tube. 5 W. input. T23.

WARREN HALL, Burlington, N. C. 28-1, Aero-Masters club. Live Wire Trainer with 12 oz. loading. Cub .099 and 7/4 prop. Rudder on Bonner Compound esc. Citizen-Ship 465 R/C equipment. 15.

JOHN W. HAMBLEN, W3TIK, Silver Spring, Md. 35-3. Super-Brigadier with trike gear, increased chord, different tail. 16 oz. loading. Cub .14 engine with 10/3½ prop. Rudder with escapement. Own 220 mc. equipment with 4 sub-miniature tubes in receiver. Audio tone operation. 3-tube transmitter with 2 W. input. Half wave coaxial antenna. Beep box.

DONALD HEWES, Newport News, Va. 29-17. Original plane with 44" span, 280 sq. in. area, 21 oz. loading. Cub .074 engine, 7/4 prop. Proportional rudder. North American rec. Mac II trans. Pulse box.

RICHARD HIGGINS, Kensington, Md. 35-1, DC/RC club. CQ plane with trike gear, enlarged wing and fuselage. Cameron .19 with 9/6 prop. Rudder and elevator, 2-arm escapement. Good 3-tube audio tone receiver. 6AQ5 transmitter with beep box.

R. G. KIMBALL, Janesville, Wis. 27-1. Original plane with 53" span, 410 sq. in. area E.D. 2.46 diesel and 10/3½ prop. Proportional rudder. 2-tube receiver. E.D. transmitter with 1.4 W. input. Pulse box.

CLINTON W. MACK, Chester, N. J. 60-2. CQ plane with Cub .14 and 9/3 prop. Rudder with escapement. Dover Eng. R/C equipment: 3S4 hard tube rec., 3A5 trans. Special control switch.

VERNON C. MACNABB, W9FZT, Indianapolis, Ind. 50-3. Original plane 60" span. 600 sq. in. area, 21 oz. loading. Ohlsson .29 engine, 10/4 prop, spark ignition. RME, motor cutoff. Compound escapements. Two radio channels on 27¼ and 465 mc. Citizen-Ship R/C equipment.

JAMES MARTIN, Greenbelt, Md. 29-4, DC/RC club. Enlarged Rudderbug. Rudder with escapement. Good audio tone receiver. Own transmitter with two 6AR5's. 1.5 W. input. Beep box. 18.

DANIEL MASS, Long Island City, N.Y. 25-5. Prop Spinners club. Robot. Rudder with escapement. Control Master R/C equipment. T21.

ALBERT MASTROCOLA, Middlebranch, Ohio. 30-3, Stork R/C club. Beam with 2-wheel gear. 20 oz. loading. Cub .14 with 9/6 prop. Rudder and escapement. Citizen-Ship receiver. Mac II transmitter.

CLAUDE McCULLOUGH, Ottumwa, Iowa. 31-7. Hornets R/C club. Original plane with 72" span, 1000 sq. in area, 28 oz. loading. Spitfire 65 engine with

(Continued on page 65)

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Write for free catalog
ACE RADIO CONTROL
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SUPER AEROTROL

■ Because it is one of the few outfits that can be had in both kit and completely assembled form, there are doubtless more Super Aerotrols in use than any other commercial R/C equipment. Berkeley Model Supplies states over 5000 have been sold.

The transmitter is of the hand-held variety, with all batteries carried in the sheet steel case. While you can save considerable money by purchasing it in kit form, you actually get almost a completely assembled transmitter; all you have to do is wire it up. The chassis has tuning condenser, tube and crystal sockets, switches and lug strip already riveted to it. All necessary holes in chassis and case are punched and the case is finished in gray crackle. The chassis is held in case by four screws and may be removed quickly for servicing. Field tune-up is made easier if a ¼" hole is drilled in the top of the case directly over the slot in the tuning condenser. Under normal conditions retuning will seldom be required, unless the crystal or tube is changed.

The excellent plans sheet shows top and bottom views of the wired chassis with every lead clearly indicated. By close reference to this drawing and the step-by-step assembly instructions, the beginner in R/C should have little trouble in successfully wiring the unit. The plans also include all the circuit symbols used in the transmitter, to make the schematic diagram doubly clear.

In actual use, the transmitter should be held in both hands about waist high, with the antenna projecting vertically. The right thumb will then be near the On-Off switch, while the left thumb is used on the keying button.

The transmitter is crystal-controlled, as required for operation on the examination-free 27¼ mc. spot. The circuit utilizes a single 3A5 tube, with both sections connected in parallel. Rather loose coupling is used to the ⅛th wave antenna; this results in less adverse reaction when the transmitter is handled during use.

As a kit, the transmitter comes with crystal, but less tube and batteries. The tube and crystal are included with the finished unit; you get a finished antenna in either case.

The Super-Aerotrol receiver kit includes a drilled linen bakelite "chassis," which has six eyelets on it for connection purposes. The tube is held by a band around a long lug, and by threading the clipped leads through four "flea clips." The tuning coil is completely finished, as is the RF choke. You have only the simple job of mounting a few parts and wiring them. Flexible battery leads, potentiometer, and meter socket and two plugs (one for meter, one for a shorting plug) are part of this kit.

The relay is the moderately light and very sensitive Kurman, of 5000 ohms. Due to the compact assembly, this is probably the smallest and lightest commercial receiver available today for 27¼ mc. use.

The receiver plan sheet is just as complete as that for the transmitter and includes the same general drawings and data. In addition to these sheets, each kit features the 30 page Aerotrol Instruction Manual which gives full operating and service data for the equipment. The receiver is intended for either the RK61 or XFG-1 gas tubes; Berkeley normally supplies only the latter.

The equipment described here should not be confused with the earlier DE-Aerotrol transmitter and receiver, which are made for use on the amateur 50 mc. band, and which are sold only in kit form. The (*Continued on page* 81)

R/C MODELS

NEWS AND COMMENT BY HOWARD McENTEE

■ Information on a simple homemade actuator that is assembled from model railroad parts has been received from Samuel C. Allen (860 N.E. 99th St., Miami 38, Fla.). The sketch shows how he went about the job; the disc magnet is known as a "Jupiter Per-Mag Car Magnet," used for remote coupling. It costs about a dollar and comes with a shaft and several nuts that can be used in the actuator.

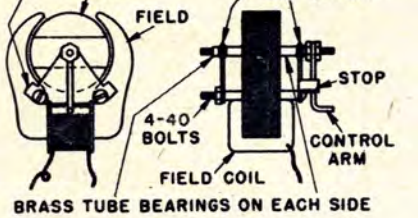
The other main component is a replacement field coil for an American Flyer whistle motor—price being around $1.75. A little snipping and soldering finishes the mechanical work. Sam rewound the coil full of #30 enamel wire, which gave him about 5 ohms. He uses the actuator in a 54" plane powered by a Cub .14. Another actuator was made with the same parts, but half the thin laminations were removed from the core, and a double-section coil was wound with #34 wire. This midget is fitted in a 200 sq. in. "guided missile" propelled by a Mac Diesel.

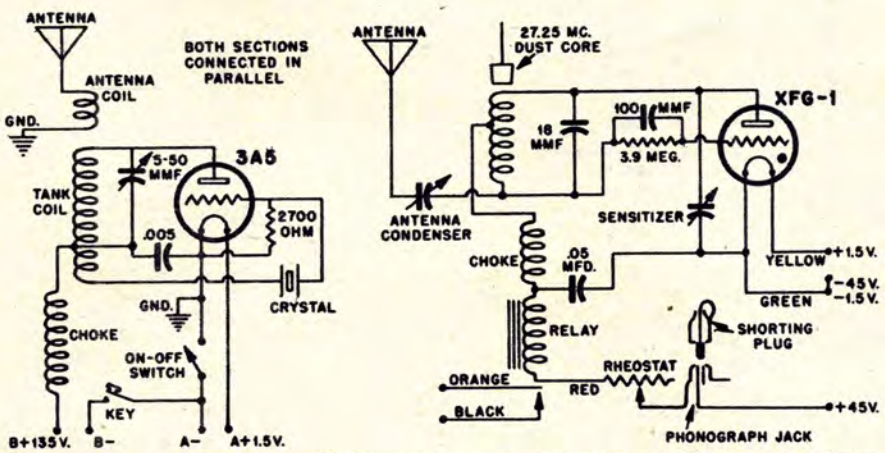
We made one of these (full size) actuators for our own use and wound on 600 turns of #32 wire, which gives about 10 ohms and a nice pull on 3 V. Winding was speeded by attaching a piece of heavy wire to the core by a single screw, and bending the wire so the coil bobbin would turn smoothly when the wire was held in the chuck of a hand drill. The actuator weighed 1.3 oz.; these units give a little less than 90 degrees rotation of the arm and they do not "center" when the juice is off. The arm tends to snap to one side or the other, but a very light spring would afford positive centering, if desired. The two main parts may be had from most large hobby shops; if you can't locate them, we find that Polk's (314 5th Ave. NYC 1) stock both.

Recently we received a pleading letter from an R/C flyer who said in effect, "Please don't mention my name in your Column for awhile. . . !" Seems he had asked last winter to have us mention his name and address, since he wanted to get in touch with other R/Cers in his vicinity. We did so—and he was swamped with about 150 letters from flyers *all over the world!* Not one of them was within 30 miles of him. He answered all of them as best he could, but practically had to give up modeling to do so, hence the plaintive request. He is now back in the air—but we'll keep his name a big secret for the time being!

Clubs and Contests. Belated news of the fall F/F and R/C meet put on by the Chicago Hobby Dealers comes from Jerry McGeorge. Held at Midway Airport, there were 12 R/C flyers on hand. Winner was Pete Mathis, but everyone else seemed to have trouble of some sort or another. Jerry feels it might have been caused by some such deal as we wrote of in our Oct. '53 Column, re the Nat Cap meet; a beautiful airport, sez Jerry—but none of the R/C boys want to go back!

Contest held by the Modesto (Calif.) Aerial Robots was a great success. Competition (*Continued on page 58*)





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mmf. ..... .45

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CLOSED CIRCUIT METER JACK..... .30
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STANDARD PHONE PLUG..... .35
PHONO PLUG & SOCKET for metering, pair..... .15
AIR TYPE VARIABLE CONDENSERS, 15, 25, 50 mmf. any type, screw-driver shaft..... .45
REMOTE PUSH BUTTON KEYING SWITCH..... .45
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Parts packages including Diagram Potentiometer & all parts (except tubes, relay, OSR coils)
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MONARCH MODEL AIRCRAFT CO. Inc.
Brooklyn 33, N. Y.

R/C News

(Continued from page 57)

was split into two classes—Single and Multi-channel (single channel outfits being defined as those having but one relay); this split seemed to work out, since all three of the multis who flew had well over 100 points, while the top single channel man had only 86 points. Winners: Multi-channel—1. Alex Schneider (San Francisco), modified Cub with Rockwood equipment, 138 pts.; 2. Colby Evett (Los Angeles), original, 128 pts.; 3. Bob Beckman (San Francisco), modified Cub with Rockwood, 114. Single Channel—1. Bob Wieland (Modesto), Flying Ohm, 86 pts.; 2. Red Smith (San Francisco), Live Wire Sr., 81 pts.; 3. Emery Stienke, Trixter Beam, 64 pts. Howard Bonner did a fine job of judging. Ray Morgan, who sent these results, says that the Pacific R/C Society is planning a contest for some date in February; probably entrants will be split into two classes as at the Robots' meet; write Ed Rockwood at Box 6, Menlo Park, for final details.

Kansas City meet held at Grandview A.F. Base produced these winners: 1. Bob McDonald (Carthage, Mo.), own make 50 mc. equipment; 2. C. McCullough (Ottumwa, Iowa), Macnabb 465 mc. with pulse; 3. Ken Wernicke (Kansas City, Mo.), own 27¼ mc. equipment. Jack Williams was fourth, since he lost out on spot landing points—and right here we find the basis for a large hassle over rules interpretations. Seems that at this contest—and at others held in the area—scoring has been according to a neat and very complete printed form, which supposedly was furnished from AMA Headquarters.

This form lists the complete AMA R/C rules for 1953 (and 1954, of course), has a reproduction of the precision pattern, spaces for points totals on all official flights, etc.; it is the form that the judge hands in to the recorders after the flyer has made all his tries. A pretty close check of this form shows that it follows the AMA rules exactly, except for one thing—it calls for spot landings in both Precision and Stunt Patterns to be judged not only on how close you get to the spot, but on *how neatly you make the actual landing.* And therein lies the rub!

The intent of the AMA rules was to have no "precision judging" on the spot landings whatever, other than to measure for distance from the spot. In other words, if you land within 25 ft. of the mark, you get the full 24 points—even if you dive the ship straight in. On the Precision Pattern there is only item 8 concerned with spot landing, and your flight score card should show only 24, 18, 12, 6 or 0 points, depending upon whether you were within 25 ft., between 25 and 50 ft., 50 to 75 ft., 75 to 100, or over 100 ft. away. It makes no difference whether the landing is smooth or horrible. Item 14 in the Stunt Pattern should be scored in exactly the same way; however, Item 13 covers landing perfection, and it is *here only* that judging covers smoothness, lack of bounce, etc. You can get 24 points for Item 14 and still get zero on Item 13.

We have checked with AMA Headquarters and find that the score cards in question did not originate there. The cards were not checked with the AMA R/C Committee, and so cannot be considered "Official." Perhaps the rules should be changed on this matter, but as the Midwest flyers say—they want to see the rules interpreted the same at all meets, regardless of what the interpretation may be. We would like to get in touch with the parties who make up this very nice card, to try and get this matter ironed out before next contest season.

Word comes from Ken Damewood (1007 Glenn St., Crescent City, Calif.) that there is no active R/C club in his area, but he and Harold Reed and others are trying to promote interest. Get in touch with them.

R. L. Brown (Ontario, Calif.) tells us that R/C boat interest is so high on the Coast that his club, the R.C. Buzzards, are planning a boat contest early in 1954. Patterns and rules are being worked out, and the Club will be glad to send a copy to anyone interested. Just drop the Buzzards a card with your address. Meet will be held at Puddingstone Dam Recreation Area, just outside of Pomona. Brownie notes that it

"sure is nice to come home *every* Sunday with all your gear intact!"

An International R/C contest held at Brussels was won by Jean-Pierre Gobeaux, flying an E.D. "Queen", with reeds. As the winner came from Belgium, next year's meet will be held in that country again. After reading of the meet, Claude McCullough began to wonder why an American R/C Team should not attend in 1954; as Mac points out, the U.S. Wakefield and FAI gas teams won out in 1953 and as a result, the 1954 meets in these two categories will be held in this country. There will not be the great expense of sending these two teams to Europe this year—why not send over an AMA-sponsored R/C FAI Team? Why not, indeed? Drop the AMA a line on this, if you are interested, you R/C contest enthusiasts.

Technical Notes. The little plastic boxes such as that used by George Trammell for the two-tube receiver shown in the Dec. '53 issue come in many different sizes, most of them with hinged covers. It is possible to form deeper (or more shallow) boxes by combining two tops or two bottoms of these boxes. The hinge joints of most of them can be snapped apart, and are made so the tops or bottoms (which are usually of different depths) can be mated together.

After a bit of scouting around, we located the maker of a large line of these plastic boxes, in all sizes and shapes. Since the concern has no distributors, they have agreed to sell direct to our readers, but specify that the minimum order must be $3.00 or more. They have a large catalog; get together with your club members and make up an order, if you can't dig up the boxes you need locally. Write to Bradley Associates, Inc. (1650 N. Damen Ave., Chicago 47, Ill.).

Norm Davis (Dansville, N. Y.) has a neat trick to make sure that the engine in one of his little radio planes is running at the exact speed he wants. Installed inside of the windshield is a tachometer! However, it is just a length of music wire, which has been cut to the right length so that it vibrates strongly when the engine is running at the desired rpm.

This is the same idea as the well-known Vibratak, but in Norm's plane the tach wire is fixed and the engine speed is varied to secure the desired results. The wire can be tuned to the correct pitch by clipping the length—which will make it work at a higher rpm; to lower the vibration period, a bit of solder can be put on the end. You can even put in several wires, so that you have means to judge just the right speed for pattern flying, stunts, windy weather, etc.

Several suggestions and comments have come in from Claude McCullough (Route 5, Ottumwa, Iowa), that might be helpful to other R/C experimenters. Mac has been using Macnabb 465 equipment in his pulse system for some months with fine results. He recently had his receiver "souped up" at the factory and finds it will work at 300 pulses per minute; however, he had to replace the 2 mf. electrolytic condenser on the relay with a .5 mf. paper condenser. Citizen-Ship engineers frown on this replacement, stating that it won't work on all receivers. However, it is a must if you want fast pulsing on 465, and McCullough, Jack Williams and many others in this area use the receiver so modified, with very good results.

Jack has been using a motor-driven pul-

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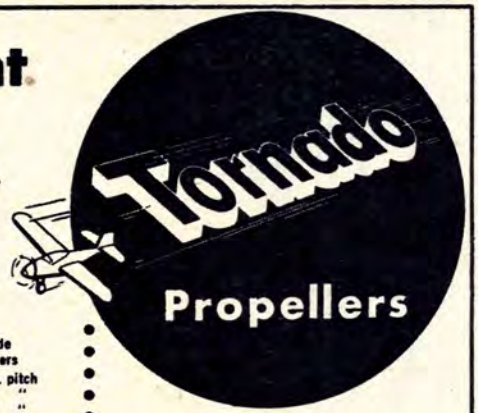

Radio Control Propeller

(recommendations)

Engines	First Flights and Low Altitude	High Altitude and Maneuvers
All .049's.....	7 in. dia. 2 in. pitch	7 in. dia. 3 in. pitch
Cub .074.....	8 " " 3 " "	8 " " 3 " "
.09's.....	10 " " 2 " "	9 " " 3 " "
.14's and .15's...	10 " " 3 " "	10 " " 4 " "
McCoy .19.....	11 " " 3 " "	10 " " 4 " "
Cameron .19.....	11 " " 3 " "	11 " " 4 " "
K&B .19.....	12 " " 3 " "	11 " " 4 " "
Fox .19.....	12 " " 3 " "	11 " " 4 " "
K&B .29.....	12 " " 3 " "	12 " " 4 " "
Fox .29.....	12 " " 3 " "	12 " " 4 " "
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R. C. Propellers

10 in. dia. 2-3-4 in. pitch—35c ea.
11 and 12 in. dia. 3-4-5-6 in. pitch—45c ea.

Plasticote Propellers

5" and 6 in. dia.—15c ea. 7 in. dia.—20c ea.
8 and 9 in. dia.—25c ea. 10 in. dia.—30c ea.

For the STUNT FLYER

The new 10" dia. Plasticote Propellers are now available at 30c ea. in 5 and 6 in. pitch. On all the .29's use a 10-5, on the .32 and .35 a 10-6. Forster 29 and 31, McCoy 29, do very well on the 10-5. The efficiency of the Plasticote propellers run up to 95%, and it may be advantageous to try a 10-5 instead of a 10-6.

RADIO CONTROL NOTES

When flying R. C. it is necessary to reduce venturi opening from 25 to 50% on almost all engines. Large props slow your engine R.P.M., reducing suction. The model does not fly level at all times . . . dives and stalls are encountered changing the fuel force. Plug the venturi opening to such an extent that you get the power you want from your engine. Too much speed in R.C. can be disastrous.

GRISH BROS.
St. John 1, Indiana

ser known locally as the "coffee grinder," which made so much noise in operation that it was impossible to hear his plane engine, to check for high or low speed. Mac made a similar unit, but mounted all the working parts on rubber; it is practically silent in operation.

Mac notes that he wrote to John Curry for a copy of John's reed receiver schematic, which we mentioned here a few months back. We failed to give the street address, though, and the letter was returned. Other readers who have had the same trouble can get this schematic by sending a quarter to John at 599 26th St., Manhattan Beach, Calif. John has recently taken over Jacks Hobby Shop in Hawthorne; guess what kind of equipment he will be most enthusiastic over?!

We have mentioned insurance here before, but upon hearing from Jim Reed of the D.C./R.C. (Washington, D. C. area) that his group has a policy which covers them during *sport flying*, we undertook to get more dope on this. The policy is provided by Heber Smith Morris Inc. (Pitt and Cameron Street, Alexandria, Va.). This concern has several policies for hobbyists, but the one we feel is most of interest to R/Cers is what is called "Third Party Liability Insurance," and is available to any AMA chartered model club. Minimum policy premiums range from $20 upward, depending upon the liability limits; we understand that quite a few claims have been presented and settled covering spectators being hit by planes, automobile damage, etc. We strongly urge all club groups to get the info on these forms of coverage; the concern that provides it is the same one which handles the regular AMA insurance policies.

We have found that the plastic Hillcrest battery boxes made to hold four pencells will carry two 22½ V. batteries, but they have to be Burgess type U15. Other makes in equivalent size are just a bit too fat. The box with flat strip contacts is the best; you will have to cut out the threaded plastic stud, and hold the cover on minus the center screw. This makes a very neat holder for a 45 V. supply.

Walt Good writes of a queer difficulty that was discovered on Don Clark's ship. Each flight would start out fine, then the escapement would stick in operated position; it could usually be gotten back into service by repeated beeps, but nothing could be found in ground checks that would make it repeat the sticking. Finally Don found his trouble in an electrolytic condenser he had across the relay points, in series with a 10 ohm resistor. Seems the electrolytic would slowly get leaky enough to hold the escapement "operated" for a while. He cleared the trouble by changing to a .01 ceramic condenser, in series with the 10 ohm resistor. He also placed a 50 ohm resistor right across the escapement winding, to further cut down on relay point arcing.

Commercial Corner. C P Distributors (Box 4094, Los Angeles 24, Calif.) is new concern listing such diverse items as lightweight silk, nitro-methane, Bonner escapements, new Sigma 4F relays ($4.75), etc.

Polk's (314 5th Ave., N.Y. 1, N.Y.) have the Fenners-Pike servo unit, an English development that offers proportional control plus another on-off control, all on one channel. Main control will usually be utilized for rudder, has plenty of power for large planes, boat installations, etc. Requires two 3 V. batteries, one for each direction. Secondary control can work an escapement, a magnetic throttle valve, etc.; it may be held on continuously, while rudder control is also in use. Unit is compact motor-driven assembly weighing 2.7 oz., and costing $12.50. Pulser will be available later.

Model Aircraft Control Co. (Box 333, Station D, New York 3, N.Y.) expects to market items useful to R/C builders, and is seeking ideas in this line. If you have one, write Frank Zaic at above address—it could be profitable for you. Concern offers kits for wing and stab parts in three sizes, 60, 50 and 42" spans; parts are completely prefab—this is the fast way to build new wing for your experimental ship—and best balsa is featured. M.A.C. has heavy duty 3½" wheels with aluminum hubs for radio models—price about $3.50. Can supply pocket-size escapement rubber winder, in flat can 2"

dia., for $1.25; this 5-1 ratio winder will handle ¼" rubber, if necessary.

Several new products listed by Gyro Electronics (325 Canal St., N.Y.C.) 13); they offer finished ready-to-use 2 V. power supply that will give 90, 135, or 180 V. at 30 ma., for $10.95. Kit for relay-type proportional pulser at $6.95 includes B battery, box about 5" cube, cord and plug. Switch-type beep box for escapement flying comes with cord and plug, finished switch, non-reverse mechanism, costs $1.95.

New entrant in R/C field is Theall Eng. Co. (Media, Pa.), long-established manufacturer in electronic and other fields. First product is a finished gas tube receiver costing $16.95 complete with tube, relay, pot, etc. Receiver base measures 3¾" x 2" and set weighs 1 2/3 oz., less relay. Dual tuning is a feature, and this 27¼ mc. set will work on 45 to 70 V. B battery. Other products are a whip receiver antenna for this band, and an R/C escapement fitted with a 2-speed motor arrangement. Raytheon RK61 tubes sell for $2.95.

Electronic Specialty Supply Co. (58 Walker St., N.Y.C. 13) announces that branches are being set up in widely scattered cities around the country, to speed service to customers; branches already functioning in Denver, Los Angeles, Omaha, with many more soon to be ready. All goods listed in ESSCO ads will be stocked at branches, giving mail order customers quicker service and a saving on postage.

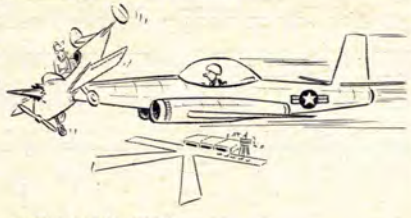
Combination offer is made by Ecco Mfg. Co. (Box 393, Smyrna, Ga.) for a two-control escapement (has double shafts for rudder and elevator, uses single rubber motor and single magnet) and a matching ground control switch. Both units for $14.95. Escapement measures 1¼" x 2½" x 3½", weighs 2 oz., can be used with ⅛ or ¼" flat rubber. Concern has several other R/C items under development; products will be sold by mail and also through usual model distribution channels.

Arrow Sales Inc. (7460 Varna Ave., North Hollywood, Calif.) offers PE-157 units in like-new condition for $12.95 each, FOB N. Hollywood. Also new 2V Oak synchronous vibrators for 39c each.

Ace Radio Control (Box 301, Higginsville, Mo.) has many new R/C items in latest price list. Kit for gas tube receiver lists at $2.25, contains all needed parts except tube, relay and batteries. Transistor conversion kit for use with above (or any single gas tube receiver that gives plate current drop to .1 ma. on signal) sells for $4.75, including Raytheon CK722 transistor. Neat little item is Ace dry battery "charger," which will rejuvenate many sizes of A and B batteries; allows two or three times the life from most cells and batteries. Charge rate is self-adjusting, according to battery to which it is connected; charger costs $7.00. Latest R/C Bulletin is free.

Control Research (Box 9, Hampton, Va.) has expanded line to include many items from other R/C manufacturers, for convenience of customers. For example, C.R. will have full line of Acme A and B battery cases; these are made in sizes to hold one to four standard or miniature pencells, also for two or three 22½ V. B batteries such as Eveready #412. Three-battery size will hold two 22½ B's and two pencells—entire receiver power supply in one compact package—costs 85c. C.R. stocks Adams proportional control actuator for $6.45. A new line of snap fasteners something like heavy duty dress snaps will be useful to the R/C builders; made in several styles, including some with threaded end, and low in cost.

Doyle Thompson (307 So. First St., Guthrite, Okla.) has been selling a throttle which he fits to certain model engines on a custom basis. He offers brand new Torp. .19 and Forster 29 engines fitted with this throttle for $23.70 and $20.95 respectively. Other products are a tiny gear box of highest quality, and copper bonded Micarta sheet



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18" span, Controline .065 to .199 engines $3.39

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32" span, Free Flight .030 to .099 engines $1.95

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24" span "Class A" Controline .099 to .16 engines $3.50

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TRANSMITTER Model 27X (pictured)
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SEE YOUR DEALER
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suitable for "printed circuit" transmitters and receivers; 4" x 4" piece with full instructions sells for $1.00.

Electronic Model Engineering (6127 Alta Ave., Baltimore 6, Md.) is still producing the 5-tube superheterodyne R/C receiver for 27¼ mc. which was mentioned in this Column some months ago. A new smaller version will soon be available that measures 4" x 2½", and has much greater sensitivity. 5-tuber sells for $39.95, less relay. Plans for this unit list at $1.65, and plans for a 5 W. transmitter are $1.50.

Need a simple foolproof stunt tank for R/C work? One good solution is the Dmeco Positive Flow Tank, which was originally intended for U-control acrobatic flying, but has proven fine for radio, too. Measures 1¼ x 1¼ x 2", holds 1.6 oz. of fuel (will run a .15 engine for about 15 minutes) and sells for $1.25. Will enable you to do the wildest possible maneuvers, including extended upside down flight—with absolutely steady fuel flow to the engine. Operates by means of an internal swivel on the fuel tube to the engine.

Motor of Month: "OK" Cub Diesel

(Continued from page 50)

the contra piston and cylinder so there is little movement to wear the plastic seal.

External features are very similar to the Cub .049B. Both radial and beam mounts are provided. A detachable fuel tank is mounted on the rear of the crankcase. Ample finger room is provided between the needle valve and propeller by an extended propeller drive washer. The compression adjusting screw has a fine thread for easy adjustment. A fiber insert in the cylinder head grips the screw and holds it so the compression setting will not "float" or drift.

The engine test proved very successful. Starting was easy after a few trial runs to get acquainted. Reducing the compression about 1/3 turn and opening the needle valve ½ to 1 turn from running position gave the best results. A prime of approximately 2 drops in the exhaust and no choke was satisfactory. If the engine should load up with oil and kick violently, do not further reduce the compression setting. Blow through the exhaust to remove excess oil, add a light prime and flip again. This occurred only once during the test and was no problem. Engine operation was very good at all speeds. Heavy propellers make starting easier and save the fingers. The 8/6 propeller looks very large, but the engine starts easy and performs very well. Speeds around 12,000 to 13,000 rpm should give best results. The 6/4 propeller was heavy enough to start easy, but a flywheel should be used with smaller props. After 3 minutes' operation a small plastic propeller broke and is not recommended. The fuel suction test of 7" is very good for a diesel engine.

The Cub .075 possesses all the well-known advantages of diesel operation including excellent fuel economy, no fuel proofer or special dope required on plane, no batteries or wiring.

Engine Data

Performance. Weight less tank: 2.03 oz. Propellers: 8/6 wood, 7,800 rpm; 8/3½ wood: 8,800 rpm; 7/4 wood, 11,600 rpm; 7/4 plastic coated wood, 12,200 rpm; 6/4 wood, 15,300 rpm; 5½/2½ plastic, 16,800 rpm. Fuel: OK Cub Diesel fuel. Fuel suction test: 7" at 12,200 rpm.

Design Data. Displacement: .075 cu. in. Class: A. Bore: .478 in. Stroke: .417 in. Stroke bore ratio: .87. Compression ratio head: variable. Compression ratio base: 1.47. Port area intake: .018 sq. in. Bypass: .029 sq. in. Exhaust: .058 sq. in. Ignition: high compression.

Construction Features. Bearing: crankshaft, hardened steel on aluminum. Crankpin, hard steel on hard steel. Wrist pin, hard steel on steel. Spring-loaded contra piston absorbs shock caused by knocking.

END

Western

(Continued from page 15)

the latter co-sponsored the contest, a real enthusiastic crowd too. Hope they don't let the success of this meet go to their head, don't think it will, but a real nice contest. The first guy to register got a can of fuel, first six-minute flight, a can of fuel, first crack-up a can of fuel, first guy to bag a rabbit, a can of fuel—and that really happened. Rodger Coleman came up over the hill, kicking rabbit in one hand, Mac-diesel job in the other. The story he tells goes thisaway, podner: "My ship came gliding down and hit this animal, the animal keeled over and kicked a hole in the wing. Think it was paralyzed with fright." That's the story. We think perhaps that glide must have been just a little bit steep.

Engine runs were limited to 15 seconds due to the small field, which led one Flightmaster to pull just about top flub for our money. The guy pulled two flights of exactly 20-sec. run before someone happened to mention the 15-sec. limit.

For all you guys who have been having trouble holding out your engine timer without special gadgets which don't always work—Toshi Matsuda and Larry Boyer were both using spring clothespins to hold them open. Just pull out the timer, put the clothespin on the shaft and let her close as far as the pin allows it, pull out the timer when ready to fly, pull off the clothespin and let the ship go. Real simple and good.

San Bruno, another big WAM contest, 220 entries this time. To quote Pop Robbers: "*AND* the wind blew a gale during the entire day with intermittent showers to make everyone comfortable. During the morning the showers were downright downpours. Chet Haworth and his stunt judges did a marvelous job of writing in the rain—did you ever try judging in the rain, try pull-testing in the rain, or just try adding up a wet column of wet figures on a piece of wet paper? Try it some time."

With all this Mark Brown did 130.48 with

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New! WORLD'S LARGEST GAS MODEL BOMBER B-25

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This 1" scale model can't be told from the real North American B-25 Bomber. Features of the construction set are 3" scale rubber tired alum. disc wheels, 4¼" alum. cowls, planked type balsa fuselage, ready cut tail and rudder balsa, alum. guns, all parts, and full size drawing. For easy handling of this model, the outer wing panels are removable, reducing the wing span to 30". Two OK 14 or 23" type motors can be used. Const. set, postpaid..... **$20.00**

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48" Span. Free flight or U Control

Improved with new 2¾" alum. spinner and 3" Veco alum. disk semi-pneumatic rubber wheels. Planked type body, parts printed on balsa, and all parts. Set **$9.00**

REPUBLIC P47D GAS MODEL

35¾" span, ⅞" scale. Length 30½". One-piece moulded, clear plexiglas cockpit enclosure. 2½" scale alum. disk rubber wheels. Body planking full size plans. Uses B or C motor. Set **$5.95**

9' TAYLOR CRAFT GAS MODEL

9 foot span. Can use Radio control. Set has 36 ready cut wing ribs, cut plywood body formers, 16" carved prop, tail wheel unit, 2 full size plans, printed balsa, silkspan, etc. Uses "C" type motor, single, twin, or 4 cyl. motor. Set without motor or wheels, postpaid..... **$17.50**
Extra pair of 4½" airwheels, $3.00

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33½" Span. ½" Scale

Set has two alum. cowls and scale Veco rubber tired wheels. Model can use ½ A motors. Wasp, etc. Set less motor **$7.00**

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24" Span. Only scale jet model on market designed to take 150—jet or power unit. Deliveries start Jan. 15. Const. set.... **$4.00**

VOUGHT F2G GAS MODEL

41" span. U Control B or C Motor. Scale model of 1949 Thompson Trophy winner. Set has 2½" scale rubber tired alum. disk wheels 4¼" aluminum cowl, body planking, moulded, clear plexiglas cockpit enclosure, plastic spinner, etc. This is one of the finest equipped models in the world. Const. set..... **$7.00**

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32½" Span. Length 22¾". 1" Scale.
A real collector's item. Finely detailed. Set has air wheels, ready cut pans, turned balsa cowl unit, parts printed on balsa. Const. set..... **$4.50**

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41" span. 1" scale. Rubber driven. Standard set. Wood wheels, balsa front..... **$5.00**
De Luxe set #2 with Veco scale wheels and alum. cowl **$6.50**

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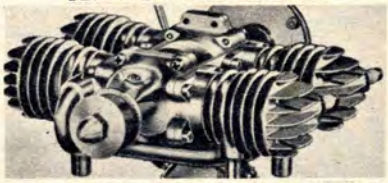

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Glow type..... **$46.00**

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Wingspan (with wing tanks) 23⅝"—length 25". This flying jet scale model of the latest fighter ordered into production for our Air Force is amazingly realistic. Fuselage designed to take a Jetex 150 engine and Jetex augmenter tube for extra power. Plan provides flying instructions.

Send 10c for new 1954 Comet Illustrated Catalog—122 Models

his Torp .19 speed job. Joe Foster recorded 127.25. Joe moves up from advanced class next contest—he graduated! We notice another outstanding thing—John Lenderman was third behind Les Perrings and Rudi Aron. Incidentally, Rudi, we need some dope on that stunt job of yours. We note, too, that Jack Friedland is back from a tour overseas and just as hot as ever. Oh, yes, Rudi Aron and the Randalls fought it out again for flying scale. The Randalls won this time—maybe Rudi was handicapped too much; suspect Ray and Virginia will now find it tougher to win, too, unless they have a new model.

The Vancouver Glo-Bugs have been hard at work getting flying sites set up. One in a football stadium, one on an old housing project now abandoned, a third whose location they won't name since site number two was discovered by a gang of murder-cycle riders. These guys found that U-control circles were nice and smooth and proceeded to tear them up. Every time the Glo-Bugs smoothed it down, the cycle riders tore it up. So-o-o, they now have this secret field. They consider themselves real fortunate; they at least have a choice of flying sites, where too many guys don't have any. All fields are within a three-mile radius. Thanks, Dick Lowe—how about more?

Tucson and Phoenix have scheduled their contests. Tucson on the 31st of January and Phoenix on the 14th of February, moved up because of the bad weather the past two years. All classes including R/C. If you are a model builder, they have events for you, two contests you can't afford to miss. See you at both of them!

—DICK EVERETT

Dope Can

(*Continued from page* 10)

England.

"Output includes the smallest production engine in the field—a midget of .020 cu. in. displacement. Starting in a two-car garage, plant now covers 4,000 sq. ft. with annual consumption of approximately 12,100 lbs. of aluminum, 50,000 lbs. of steel, 8,000 lbs. of cast Meehanite bars and 7,000 lbs. of brass and bronze.

"Tooling is standard with one exception. Built in 6 weeks for a bit over $1,000, a special attachment was made for a 10 inch engine lathe. Prior practice required three separate operations to bore the crankcase for the cylinder, machine and spot-face the main bearing, and drill the venturi.

"The attachment enables all three to be done in one set-up and paid for itself in 7 months.

"While this is a description of but two firms, it is fairly representative of the industry. In time of peace, it serves to fill a market demanding high precision. In time of war, it turns to close tolerance defense subcontracting. Producers of these miniature engines have always found their abilities in high regard."

Right you are, Bob, and thanks for an informative glimpse of the model engine industry.

—THE DOPESTER

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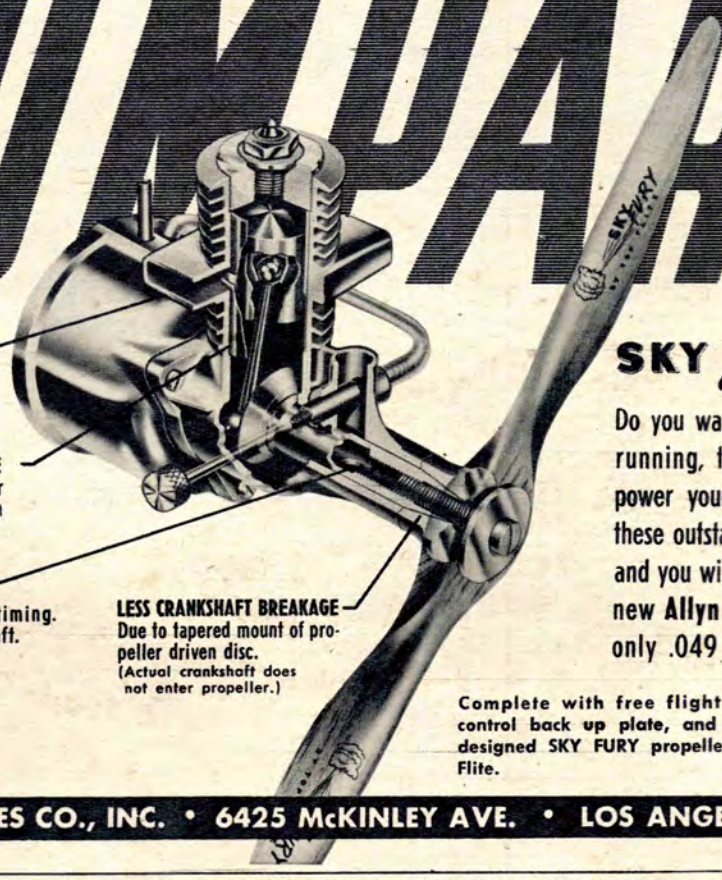

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R/C at Nats

(Continued from page 55)

13/5½ prop. Triplex control system; RME, with proportional rudder, escapements for motor and elev. Citizen-Ship R/C equipment, motor driven pulser. T21.

FRAN McELWEE, So. Plainfield, N. J. 34-6, Guided Missiles R/C club. Original design with 72" span, 865 sq. in. area, 20 oz. loading. Fox .35 with 11/4 prop. RME with Schmidt reed equipment. Stick type control box. 7.

H. G. McENTEE, W2SI, Ridgewood, N. J. 47-13. Modified Brigadier, 54" wing span, wider fuselage, larger rudder, 430 sq. in. area. 17½ oz. loading. Bantam with 10/3½ prop. Proportional rudder, and motor. Own 3-tube receiver. Own 2-tube transmitter on 50 mc. 18 W. input. Motor-driven pulser.

ART MOFF, Grand Rapids, Mich. 28-1. Live Wire Senior, beefed up. Rudder and motor with Bonner Compound esc. Super-Aerotrol R/C equipment. 24.

ALFRED J. MONTZKA, Washington, D. C. 47-2, DC/RC club. Beam. Rudder with Bonner Compound esc. Citizen-Ship 465 R/C equipment. T-23.

JOE PICORALE, Morristown, N. J. 35-4. Jaseo Trainer. Rudder with esc. Own RK61 receiver. 3A4 trans. with 3 W. input. T22.

JACK C. PORT, Fairborn, Ohio. 33-4½, Springfield Strato-Hawk. "Hi-Q" plane—own design. 54" span, 490 sq. in. area. 18 oz. loading. Torp .19 with 10/6 prop. Rudder with own make escapement. Controlaire receiver using CK5672 tube. Controlaire trans. with 6C4 tube, 4.8 W. input. 1.

GEO. W. POYTHRESS, Hampton, Va. 32-4, Brain-Busters Model Club. Original plane with 40" span, 240 sq. in. area, 9½ oz. loading. Wasp with 6/3 prop. Rudder with pulse control. Control Research receiver and transmitter. Beep box.

NATHAN RAMBO, Wynnewood, Pa. 23-4, Golden Eagles club. Modif. Super Buccaneer; 8 ft. span, wider fuselage, beefed up. 24 oz. loading. Forster .99 with 14/6 prop. Spark ignition. RME with modified Rockwood and Schmidt reed equipment. Stick type control box.

RUDOLPH J. REDD, W3UUE, Baltimore, Md. 29-2, Balto. Congress of Model Aero. Original plane with 72" span, 864 sq. in. area, 16 oz. loading. O&R .23 engine with 10/3½ prop. Bonner SN escapement. Miller hard tube receiver. Original transmitter on 50 mc. with two 3A5 tubes, 8 W. input.

JAMES V. REED, Silver Spring, Md. 35-3, DC/RC club. Original biplane with 72" span, 1870 sq. in. area, 16 oz. loading. Atwood .60 with 13/6 prop. Proportional control on rudder. Good 3-tube audio tone receiver. Own

(Continued on page 67)

CAT'S WHISKERS AND HOW

$3.95 KIT

all pre-cut in grade A Balsa 40" wing span, 24" fuselage ruggedly constructed for stunt, combat or sport flying for 19 to 35 cu. in. Disp. Engines. Easy to build and fly, swept back wing butterfly elevator and stab. Solid leading edge, redi-cut fuselage.

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Now for the first time a fuselage made of a special magnesium designed to endure all types of flying. Can be used over and over again regardless of the beating it takes. Will save you many dollars in the long run. Complete model kit illustrated below weighs only 24 ozs. including torp. .23 engine. Features four bolts for quick replacement of wings and elevator; leading and trailing edges; cut to shape die-cut wing ribs; cut to shape rudder stabilizer and elevator. Solid wing tips; wing span 39-ins. Compactness of this flying model kit makes transportation to and from flying fields a cinch. **$6.95**

Excellent for combat flying.

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beautifully detailed. Accurate ½" scale reproduction with cut to shape wings, stabs and rudder. Plus all hardware detailed plans for a really fine model 23½" wing span, **$3.50**

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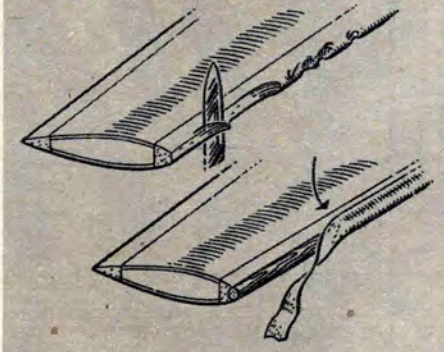
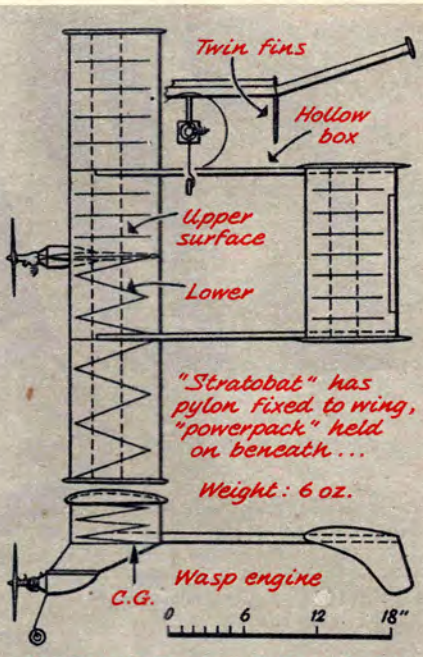
When leading edges get nicked with hard use, inset hardwood dowel suggests Bob Brown, Toronto, Ontario

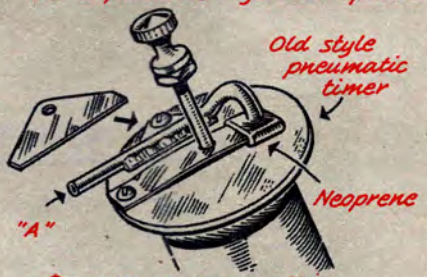




Sketch-book

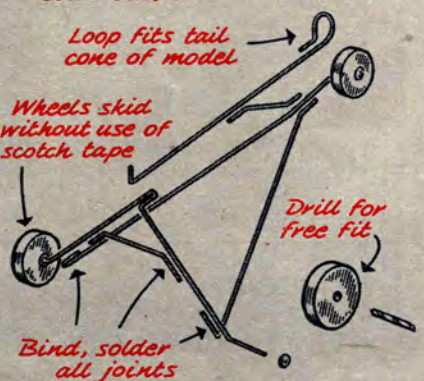
Phillip Pauley, S. Plainfield, N.J., made original F.F. with low aspect-ratio surfaces and built-up ribs. Ship proved to be dependable flyer. 30" span—

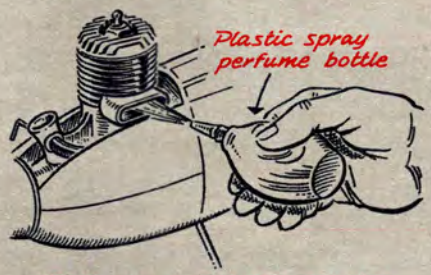
Have you developed something new in construction, control or flying? Send a rough sketch—we'll redraw it and pay $5 for each accepted. Contributions should be original ideas; sorry, we cannot enter into any correspondence on submissions.



Nifty fuel cut-off by Phillip Hamm, Jr., Robertson, Mo. "A" connects to tee in fuel line, operates as air bleed—

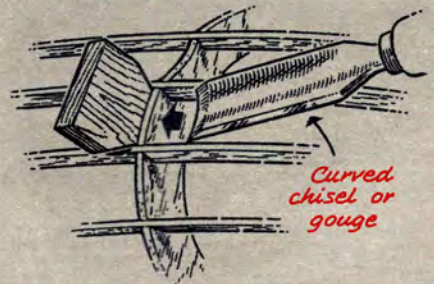
Coat hanger wire and three plastic checkers make dolly for A/2 speed models suggests Sgt. Norm Anderson, Columbus, Ga.





Easier and better priming through exhaust with little danger of flooding engine in this method used by Karl Munzlinger, Tulsa, Okla.

A.M.A. numbers; light, neat and colorful can be trimmed of tissue for freeflight models with street numbers as cutting patterns says Frank Mock, Pensacola, Fla.



"Scalloping" formers makes for better covering job. Nisse Holmström, Swedish modeler, backs up former with hardwood block, makes cuts with chisel—

(Continued from page 65)

trans. with 6AQ5 tube, 4 W. input. Motor-driven pulse control box.

RAY REGALIA, San Francisco, Cal. 33-5, S.F. Mustangs club. Original plane with 88" span, 1232 sq. in. area, 20 oz. wing loading. Spitfire engine with 14/5 prop. Spark ignition. RME with Rockwood R/C equipment. 12.

KENNETH SATTERLEE, Waterloo, Iowa. 38-3. Beam. Rudder and escapement. Citizen-Ship R/C equipment.

CARL SCHMAEDIG, Clark Township, N. J. Guided Missiles R/C club. Original plane with 72" span, 864 sq. in. area, 18 oz. loading. Fox .29 engine with 11/4 prop. RME with E.D. reed unit and modified McEntee receiver. E.D. transmitter and control box. 25.

DON M. SCHRELLO, Pittsburgh, Pa. 20-2 months. Beefed-up Rudderbug. 17 oz. loading. Atwood .49 engine with 12/5½ prop. Rudder with escapement. 2-tube receiver, 3A4 trans. with 4 W. input. Errington beep box. 17.

VINCENT J. SERIO, JR., Newport News, Va. 28-3. North American "Guided Mite"; 46" span, 320 sq. in. area, 10 oz. loading. McCoy 9 engine with 10/3 prop. Proportional control on rudder. N.A. Twin-Tube rec. N.A. transmitter with 3A4 tube. Motor-driven pulser.

LYLE C. SEWELL, San Francisco, Cal. 25-3, S.F. Mustangs club. Original plane with 78" span, 1090 sq. in. area, 20 oz. loading. Spitfire engine with 14/5 prop. Spark ignition. RME with Rockwood R/C equipment. 4.

GEORGE B. SWANK, Buffalo, N. Y. 35-15, Flying Bisons club. Live Wire Senior. RME with Schmidt tuned reed equipment.

GEORGE SWEET, Beloit, Wis. 42-5, Thermal Dusters R/C club. Original plane with 60" span, 540 sq. in. area, 21 oz. loading. Fox .19 with 10/3½ prop. Proportional rudder. Own twin-RK61 receiver. 6AG7 trans. with 5 W. input. Pulse control box. 10.

H. A. THOMAS, Little Rock, Ark. 39-2. Original design; 52" span, 435 sq. in. area, 15 oz. loading. Arden .09 with 8/3 prop. Rudder and two-speed motor with escapements. Own two-tube receiver.

HENRY THOMAS, Akron, Ohio. 36-2, Rubber City Aeronuts. Rudderbug with aluminum main gear and cowl, stringers on fuse sides. 14 oz. wing loading. Delong 30 with 12/5 prop. Spark ignition. Rudder with escapement. Good Bros. R/C equipment on 50 mc.

WILLIAM P. VELLETE, Newton, Mass. 31-2, Norwood Soc. of Model Eng. Beam with 15 oz. loading. McCoy 9 with 8/6 prop. Compound escapement and Citizen-Ship 465 R/C equipment. T16.

EARL VIVELL, San Francisco, Cal. 49-15. Original plane with fiberglass fuselage and tail, 60" span, 450 sq. in. area. 24 oz. wing loading. K&B .19 with 9/4 prop. Rudder and motor control with escapement. Citizen-Ship 465 R/C equipment.

JACK WILLIAMS, Ottumwa, Iowa. 34-4, Hornets R/C club. Original design patterned after Hoosier Hotshot. 65" span, 640 sq. in. area, 24 oz. wing loading. K&B .32 with 11/4 prop. Triplex control system for RME; proportional rudder, escapements for motor and elev. Citizen-Ship 465 R/C equipment. Pulse box. T26.

IVOR WINBY, Andulusia, Pa. 30-6 months. Bristol Aero-Modeleers. Brigadier with beefed-up framework. 16 oz. loading. 2-speed K&B .19 with 10/3½ prop. Rudder and motor with Bonner escapements. Own RK61 rec. Mac II transmitter.

MAURICE G. WOODS, Oklahoma City, Okla. 26-5. Frequency Jockeys R/C club. Rudolph, 18 oz. loading. Rudder with compound esc. Citizen-Ship 465 R/C equipment. 13.

JOHN WORTH, Hampton, Va. 29-4, BrainBusters club. Bootstraps. Rudder on escapement. Control Research receiver. Mac II trans. T22.

ORVEL J. YARGER, Bryan, Ohio. 36-2, Defiance Prop Floppers. Live Wire Trainer. Proportional rudder—fail-safe engine cut-off. Citizen-Ship 27¼ R/C equipment. Motor-driven pulser.

FRANK YUHASZ, Linden, N. J. 36-5, Guided Missiles R/C club. Robot with 2-wheel L.G. 20 oz. loading. McCoy .19, 9/6 prop. Rudder with escapement. Own twin gas tube receiver. Own 6AG7 transmitter, 5 W. input. 9.

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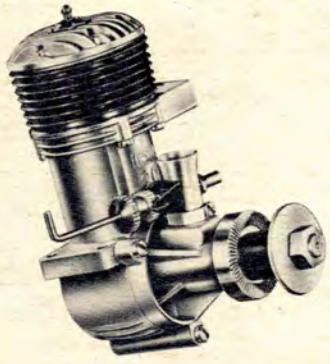

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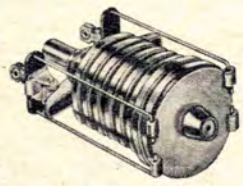
*includes augmenter tube, fuel and accessories



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*includes augmenter tube, fuel and accessories

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Southern Scene

(*Continued from page* 16)

UC-PAA load contest several months ago in Montgomery, limit of .29 displacement. . . . 100 sq. inch wing area and 60 foot lines with 1½ laps for take-off. My special Fox .29, 960 sq. in. and 3 inch shock travel on gear, hoisted 11½ pounds of lead. The all-up weight was 15 pounds. One other plane easily got off with 7½ pounds! Which indicates that we are in the PAA-Load business down South."

Jack tells about an air boat meet at Lake Jordan. Two classes, under .05 displacement and over. Ben Summerford of the Montgomery Rebelairs took first with speed of 80 mph. He used a Dyna-Jet on a hardwood three-point hull—home design. The thing never got a run of over 300 feet and the engine never stopped until it flipped. He ran it about six times and each time when it would flip it would throw spray 50 feet in the air! The Alabama fellows say it was really spectacular.

The venerable Ed Stone of Jacksonville is moving to Atlanta. For many years, Papa Ed and son Jerry have been familiar figures at all the meets down this way. Jerry has, at the age of eight, accumulated some real important trophies. Ed is a speed bug and doing all right in R/C, having won the first leg on the Jim Walker Radio Control Race Perpetual. Ed is best remembered by his fine attitude of sportsmanship and helpfulness. No matter what flyers happened to need in the way of parts, Ed happened to have it!

From faraway Yuba City, Calif., Lyman C. Armstrong writes that "Southern Scene" is widely read on the Coast. He wants to get the low-down on my resignation as VP in District 5 and seems to think that a lot of leaders and members want information why "such and such" is not being done in Washington. I do believe that one good thing will come from the position we took. Think you VP's can look for some clear definition now of the duties, responsibilities, and authority of the men who, without pay and at their own expense, represent AMA in the Districts.

From Elmira, N.Y., the city featured in Air Trails as the site of the National Soaring Contest, comes Marlowe Cassetti to cast his lot with Atlanta modelers, as a freshman at Georgia School of Technology. A modeler at heart, Marlowe inquired upon his arrival about the clubs, flying sites, and organization in his newly adopted home. We welcome Marlowe to our group—and it so happened that Lloyd Wason, new President of the Georgia Congress of Model Airplane Clubs, had just announced the eight inter-club program of contests in different sections of Atlanta. Meets are held here once a month with trophies to winners, with different clubs in Greater Atlanta acting as hosts. We'll do our best to keep Marlowe from getting homesick.

Joe R. Gilbert, Patrick Air Force Base, Fla., sends clippings of the activities of the Brevard Aero Modelers, a club composed of Base flyers. Their Sunday afternoon flying

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demonstrations are attracting large crowds of spectators.

A while ago we received an interesting letter from Curtiss B. Taylor of Lake Park, Ga., a small town near Valdosta. Curtiss is a friend of Dave Dennis which makes him a friend of all of us. Curtiss is quite a designer. He makes "odd" designs that are remembered. For example, his hand launched glider—18" wings and 23" fuselage! This ship won first in the 1952 Tangerine Internationals and first in the '53 Southeasterns. As an offspring of this model, he made a new long Half-A with a McCoy diesel that on second, third and fourth flights at the SE's hit six minutes even on every flight—had to be brought down by a dethermalizer! His designs have attracted a lot of interest in South Georgia. Fellows who have flown his models comment, "We can't keep 'em long enough to use in a contest, because we lose 'em on the test flights." He also has original design towline gliders, rubber jobs, and Wakefields.

The Navy is likely to assume real leadership and direction of the Greater Southeastern next June. New events are likely, such as Navy Carrier Landing, PAA Load, "Father and Son" event, and some new ones from Jim Walker especially for the freshmen and juniors. We predict that you'll be seeing smaller, lighter, "race type" R/C models in preparation for the second running of Radio Control Race event at the Southeasterns. Don't forget that the big Jim Walker Perpetual comes up again for awarding to the winner of the race. Cal Smith's new R/C "Jersey Lightnin'" is a good example.

—R. H. Elliott, Box 5078, Atlanta 2, Ga.

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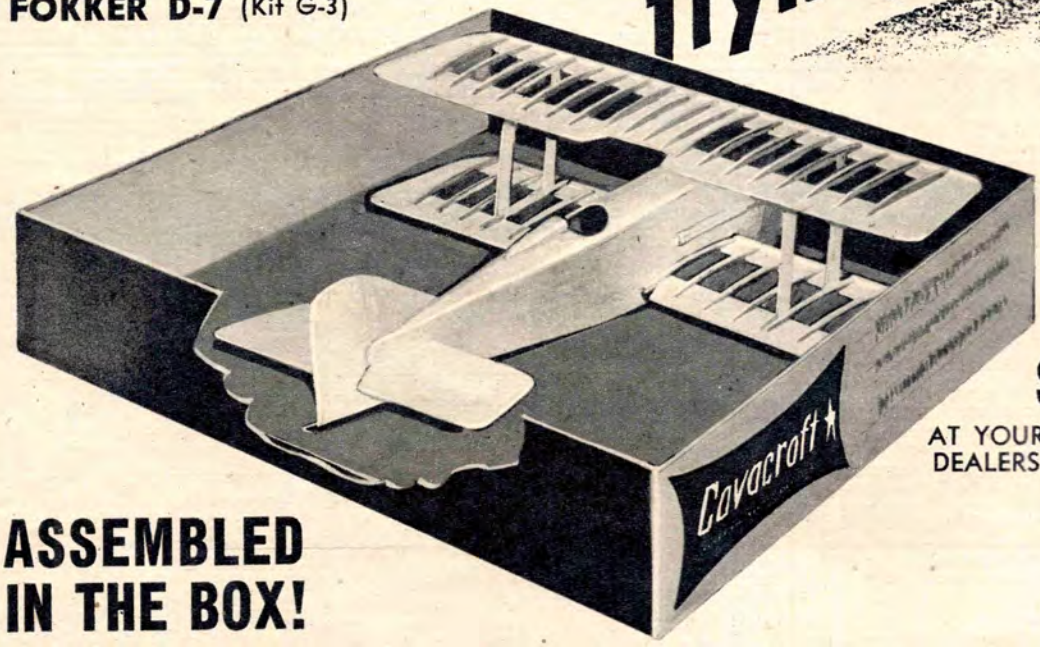

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Mitsubishi

(*Continued from page 28*)

covering and held in place with straight pins until dry.

Wing-mounted landing gears can present a problem if not properly installed. The method used on our model has been successfully flight-tested on dozens of models. First bend the landing gear struts to shape, being sure to make one right and one left hand strut. Sandwich each strut between two pieces of plywood using plenty of cement. Hold together with "C" clamps until dry. Slip the landing gear through a hole in the bottom covering, axle first, from the top and apply plenty of cement, attaching the landing gear assembly to the ribs, spar and lower covering.

When the landing gear is firmly installed the upper wing covering can be added. First the trailing edge of the lower covering must be beveled to fair into the curvature of the rib upper camber. Once the sheet covering is cut to outline shape, it can be cemented to the upper edge of the spar. Hold in place with straight pins until dry. Now apply cement in the ribs forward of the spar and the beveled portion of the lower covering and hold in place with pins. Repeat with the rear portion of the covering. Use a relatively slow-drying cement for all sheet covering operations.

Cut the solid sheet balsa wing tips to shape and cement to the wing. When completely dry, these can be carved to shape and the entire wing structure should be thoroughly sanded with 1/0 and 3/0 sandpaper. The wing assembly can now be cemented to the fuselage. The incidence angle should be carefully checked during this operation. This angle is zero degree.

If a detached tank is required it should be installed at this time. Many commercial

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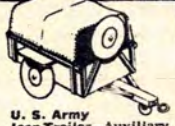

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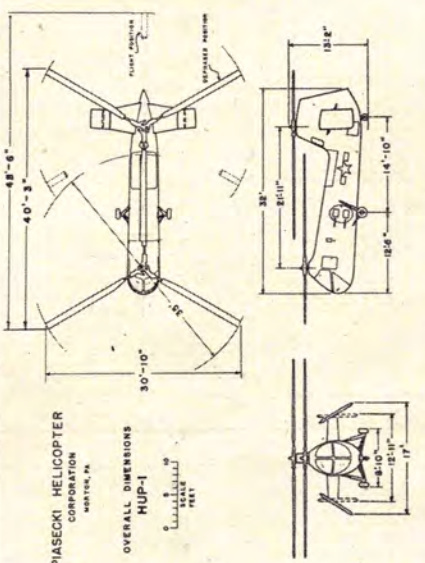
fuel tanks will fit this model, such as Perfect, Maeco, Darwin, Acme, etc. Add the plastic tubing filling and vent extensions as well as the feed line extension. When installing the tank, much care should be taken to insure a very firm and steady attachment with the fuselage structure. Many model airplanes fail to operate properly because the tank is loose in the fuselage and the resulting vibration causes the fuel to foam, causing an uneven feed.

The fuselage is planked now. Start by cementing one planking strip to each side of the fuselage, holding these to the formers with straight pins until dry. Repeat this for the top and bottom. Cement another strip to each side of the four strips already in place. Care should be taken to cement these strips to each other as well as to the formers. Strips should be beveled and tapered in order to fit the fuselage perfectly. Do not, however, worry about hairline spaces between these strips. The spaces are filled in, when planking is through, with Plastic Balsa. When thoroughly dried, the entire fuselage should be well sanded and any remaining cracks should be filled with Plastic Balsa. Sand again.

PIASECKI HUP-1

Tandem rotor Navy helicopter. Powered by 525 hp Continental. Later models HUP-2 and Army H-25 have automatic pilots, no vertical stabs.



The moderate-size wing fillet is easily made by first cutting the ⅛" sheet fillet platform and cementing both halves to the fuselage and wing trailing edge. When this is dry, several applications of Plastic Balsa can be smoothed on with the fingers. Four or five applications should complete the fillet. When quite well set (about 30 minutes) the fillet can be sanded smooth to fair into the fuselage and wing.

Complete building details are available on the full-size plans.

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Larry Bell of Southern California Soaring Assn. soaring his LK flat-top on the bluffs of Torey Pines, Calif., during a regional meet.

Sailplane Parade

■ Gliding and soaring is strictly a group activity. Prior to World War II, 99% of all gliders were owned and operated by clubs, of which there were in the vicinity of 140 in United States alone. After the war, when a number of Army and Navy training gliders were declared surplus and released for sale to the public, individual ownership came into full bloom. These gliders could be purchased from the government at ridiculously low prices ranging from $200 to $750, most of them in excellent condition and all fully instrumented.

However, the individual owners found that going off on their own was not practical, because for their flying activities they had to depend on help from friends and members of their families—who were not always available, or lacked enthusiasm. So the only solution was to join or organize new clubs. The result is that at the present time the majority of the equipment in glider clubs is privately owned by individuals.

Soaring clubs operate generally on the same basis as any other organization. They elect their officers, have by-laws, charge initiation fees and dues. Financial set-ups differ depending on equipment owned. Annual dues may run as high as $100 per year. Some clubs, that own tow planes, charge launching fees averaging $2 for the first 1000 feet of altitude and $1 for each additional 1000 feet. Others have lower dues but charge for use of club-owned gliders.

In addition to weekend flying and occasional social events, clubs organize and participate in regional meets.

Listed below are names and addresses of glider clubs presently active in the United States:

CALIFORNIA: Baldwin Park—San Gabriel Valley Soaring Group, 14808 East Arrow Highway; Bishop—Bishop Wave Workers, Box 414; Burbank—Valley Glider Club, 1112 No. Valley St.; Hayward—Northern California Soaring Assn., 2815 Fairview Ave.; Los Altos—Ames Soaring Club, 24061 Villa Drive; Los Angeles—Southern California Soaring Assn., 79 McConnell Ave., Los Angeles 45; Palo Alto—Warm Springs Soaring Club, c/o Earl Menefee, 1661 Castilleja Ave.; Sacramento—Sacramento Soaring Club, c/o V. Swierkowski, Oxford Motors, 19th & J. Sts.; San Diego—Associated Glider Clubs of So. California, 4674 Wilson Ave., San Diego 16; Van Nuys—New Douglas Soaring Club, 13902 Gilmore St.

COLORADO: Denver—Western Soaring Club, Federal Heights Airport, 11000 N. Federal Blvd.

CONNECTICUT: Hartford—The Connecticut Valley Soaring Association, 77 Oxford St.

FLORIDA: Miami—Informal Soaring Group, Rt. 4, Box 588, Miami 43.

ILLINOIS: Les Plaines—Chicagoland Glider Council, R. 1, Box 162; Mundelein—Motorless Flight Institute, Mundelein Airport; Savoy—University of Illinois Glider Club, University Airport.

INDIANA: Fort Wayne—Fort Wayne Soaring Council, R.R. 6, Covington Road; Indianapolis—Indianapolis Soaring Society, 3329 Kenwood; Notre Dame—Notre Dame Glider Club, 320 Walsh.

IOWA: Cedar Rapids—Iowa Soaring Club, c/o E. A. Kurzawa, 1325 2nd Ave. S. E.

MARYLAND: Branchville—Mid-Atlantic Soaring Association, Box 31; Lexington Park—District of Columbia Soaring Club, c/o Nathan J. Frank.

MASSACHUSETTS: Andover—Lawrence Soaring Society, c/o John Bolten Jr., Geneva Road; Cambridge—Aeronautical Engineering Society (MIT Glider Club), Room 18-12, Massachusetts Institute of Technology.

MICHIGAN: Dearborn—The Vultures, Inc., 3626 West Point; Frankfort—Northwest Michigan Soaring Club, 601 Main St.

MONTANA: Belgrade — Bozeman Soaring Club, Box 97, Gallatin Field.

NEW JERSEY: Maplewood—Aero Club Albatross, 33 Lexington Ave.; Vineland—South Jersey Soaring Society, 606 Broadway.

NEW YORK: Elmira—Elmira Area Soaring Corp., Federation Bldg.; Farmingdale—Republic Soaring Society, P.O. Box 65; Rochester—Rochester Soaring Club, 25 Hartsen St., Rochester 10; Schenectady—Mohawk Soaring Club, Inc., 1133 Eastern Ave., Schenectady 8; Wurtsboro — Metropolitan Airhoppers Soaring Association, Wurtsboro Airport, and Sail Flight, Inc., Wurtsboro Airport.

OHIO: Dayton—Soaring Society of Dayton, 917 Broad St., Dayton 9; Maple Heights—Maple Heights Soaring Club, 5546 Hollywood Ave.; Welbridge—Toledo Glider Club c/o W. R. Crow, Inc., Box 257.

PENNSYLVANIA: Perkasie (near Philadelphia) Glider Council, R.D. #3.

TENNESSEE: Memphis—Soaring Society of Memphis, 3778 Marion Ave.

TEXAS: Dallas—Texas Soaring Association, 108 Reserve Loan Bldg.

WASHINGTON: Mercer Island—Pacific Northwest Soaring Association, Rt. 2, Box 400; Seattle—Cascade Soaring Society, 2460 Westlake North, Seattle 9, and Seattle Glider Council, 2460 Westlake North, Seattle 9.

WISCONSIN: Pewaukee — Silent Wings, Inc., Aero Park Airport, Box 66B.

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The Model Biz

Inside dope from the model industry; kits, engines & accessories

■ That big Ohlsson Manufacturing Co. contest came to an end and the winner of the top prize, a 1953 Mercury, was Al Grenoble of Yuba City, Calif. Al is known well to California contest-goers and anyone who has been reading Dick Everett's "Western Roundup" column in Air Trails. Al's winning slogan: "East to West it outperforms the rest." O.M.C. are manufacturers of Ohlsson Gold Seal Products.

(*Continued on page 74*)

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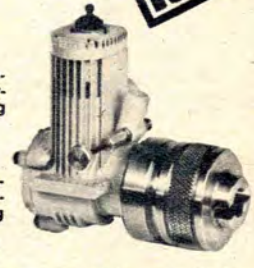

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(*Continued from page 73*)

Irwin G. Ohlsson (left, in the photo) made the presentation.

Bill Effinger, Jr., of Berkeley Models passes along the welcome information that Berkeley now has mahogany veneer available in two thicknesses: 1/28 and 1/16 inch sheets. These sheets range in size up to 8 x 24 inches. Boat builders have been looking for such. Also useful in R/C.

Comet Model Hobbycraft has a series of 6 "Flash-Bilt" sling-powered profile scale gliders that are available to the young fry in kit form for 25c each. The 2-color die-cut profilers are the P-40 Tigershark, P-52 Mustang, F-85 Sabre, Navy Skynight, Spitfire and Lockheed Starfire. Wingspans are between 9 and 12 inches; length of fuselages, 9 to 10¾ inches. Each kit has a strong rubber sling.

Honeybug

(*Continued from page 33*)

the eyelets in the tip rib as shown. Taper the lower sheet to follow the rib curve and then cut the top sheet oversize with a hole for the pushrod. Cement the covering in place. Small snap clothes pins aid in holding the edges while the cement is drying. When dry, cement the tips on and sand the entire wing smooth.

The fuselage is made by cutting ⅜" sheet as shown, and cementing the motor bearers to each side. To this, cement the bulkheads in place. Bend the landing gear to shape, sew to the plywood bulkhead and cement securely in place. The side sheets are cut to shape and cemented to the sides, forming an edge along the top aft of bulkhead #4.

The tank is installed; run the fuel line to the engine through the front firewall; run the filler and overflow out through the fuselage. Mount the engine. Secure the nuts to the brass strip and cement well to engine bearers.

The top cowl is added; see that it clears the engine and then cement in place. The lower cowl is made of two blocks and hollowed to accommodate the engine. Remove the engine. Tack-cement the spinner in place and shape the top and bottom cowl from the fuselage to the spinner, thus obtaining an even cowling contour of unbroken lines. The lower cowling can be separated and held in place with a #6-32 M.S. Cut the cockpit, add the pilot head and trim canopy to fit.

Rudder and stabilizer are cut to shape and edges rounded. Slot the top of the fuselage and cement rudder in place.

A 3/32" sq. hardwood strip is cemented to the elevators and fastened to the stabilizer with cloth hinges as shown on the plan. Slip the stabilizer in place and cement well. Add the horn and connect the pushrod. The wire skid is bent and cemented in place.

Cement the wing in place securely; the fairings are fastened with ample cement. See that the wing and stab line up.

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The entire model is doped with butyrate dope and sanded well between each coat. Trim Honeybug lightly as any extra weight is a positive hindrance to overall performance. Balance it on the forward line with the nose slightly below horizon.

Flying is done in the same manner as any other ship, except that here you can let the model take off by holding neutral, and it will rise slowly until flying level, and then it can be made to respond to your command.

Experimenting with prop and clogging the intake will give higher speed and longer engine runs. This is as important as the design and workmanship and will vary on every model.

Blueboy

(*Continued from page 37*)

these triangles—insuring the same bend on each side. Cut out the formers and build the cargo box. Glue the fuselage shell together with the cargo box in place to be certain of an exact fit. Install ⅛" sheet doublers and gussets around the firewall. Solder the engine nuts to a sheet of ¼" wide .012 brass on the back of the firewall. The front wing hold-down wire goes through into the fuselage proper where it is bent over ½" and cemented. Celluloid is cemented over the rear wing rubber holes.

Build a good landing gear *in alignment* for this is the model where it counts. Metal wheels are strongly recommended, since rubber wheels crimp and collapse over the long take-off run with the heavy cargo. The rear strut is held in a 1/16" plywood sandwich. The front strut is fastened to the sides of former B.

A Wasp tank is filed to fit the McCoy Diesel. A Hillcrest metal dethermalizer timer actuates a K&B Sure-Stop fuel cut-off. Experiment with low-pitch 7" diameter propellers. The exact pitch depends on the load. Ballast is in the form of lead sheets, ⅛" x 1½" x 2".

Visibility isn't important in this model because the ship isn't supposed to get over 100 feet high. We used blue Jap tissue (invisible over 100 feet high). Two thin coats of dope without any castor oil are brushed on.

Flying is the easiest part. Simply put in 20 or 24 ounces of ballast and begin by firing up wide open. There is no danger of a spin because the ship flies too slowly. Be certain the model is headed *exactly into the wind*. Take-offs are safer than hand launching.

Mini-Mac

(*Continued from page 53*)

control a bit.

4. The ends of L2 *must* be connected as shown on the diagram. If the plate current stands at about 1 ma. and adjustment of C2 makes no change, you have undoubtedly messed up on this detail.

(*Continued on page 78*)

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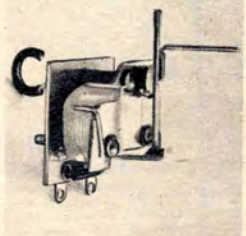

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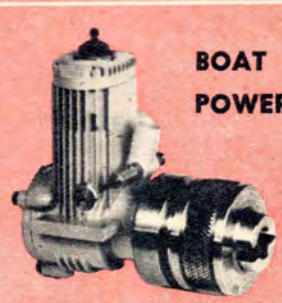

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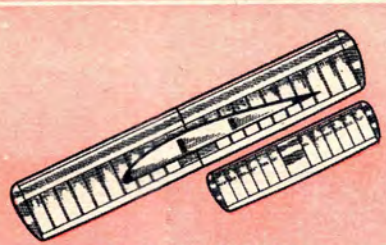

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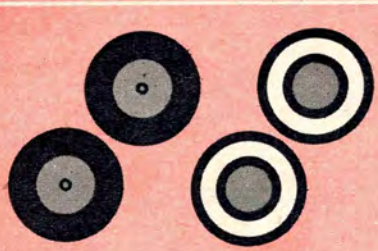

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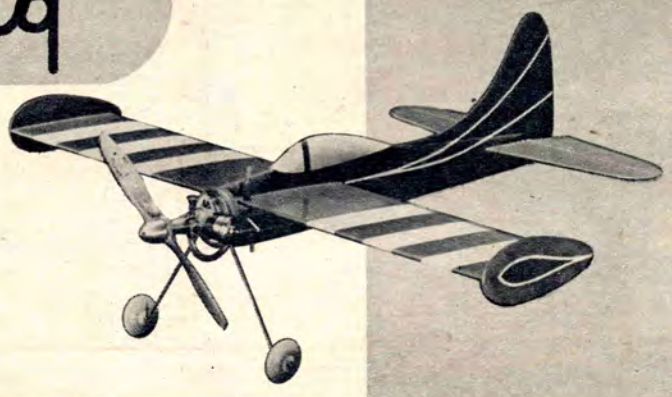

JOY PRODUCTS COMPANY, Menominee, Michigan

PHILA. FOKKER

To its extensive line of boats, race cars and solid plane models, Cavacraft has added the famous World War I Fokker D-7. It's a 50¢ deal with parts pre-shaped; you just assemble. Stamped metal landing gear, insignia decals and E-Z instruction sheet which speeds up construction time.

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Imported Swiss flight timer and stop watch is $9.95 from the Nassau Co. (200 W. 34th St., NYC 1). Sweep second hand with split second stop. Has telemeter and tachometer scales. In anti-magnetic shock resistant chrome case. Radium face. Stainless steel back. Black or white dial available.

PDQ PROFILE

Circus King is a 40-inch span stunt and combat model produced by PDQ Products Co. Takes Class B and C engines. Rudder rakes back to give it that super-jet look. A profile design, manufacturer stresses its simplicity which makes it an easy project for novice combat contenders.

PERHAPS YOU DIDN'T KNOW . . .

Just what you're missing if you don't have a copy of the 1953/54 edition of "AIR PROGRESS." Maybe a rundown of the contents will convince you. The big, 100-page annual opens with "The Unlearned Lesson" by Admiral DeWitt C. Ramsey, USN (Ret.). Then there's the remarkable pictorial "Jet Aircraft of the World"—it includes 100 photographs and 21 three-view drawings. Next come "Rotary Winged World" and "First Flight by Man," both picture reports. "From Wrights to Rockets" is Doug Rolfe's genealogy of the military airplane; 107 illustrations. This is followed by "From Junkers to Jets"—his picture story on the development of the transport airplane; 47 drawings. "The 'Tried' Pipers of Lock Haven" presents 28 "Cubs" in photo form—most of these are little known. Frank Tinsley's fascinating "He Saw the Wrights Fly" is vivid history. About this time you come to the master cutaway drawings of contemporary aircraft—what gems! They include the Convair 340, Vickers Supermarine Swift and the Fokker Mach Trainer. One of Air Progress' most valuable features is "Mystery Air Force" with its 66 photos of experimental and little-known military planes. Next the air racing section: stories, photos and paintings of the great and near greats of America's biggest air race classic. All of the Thompson and Bendix races are covered—27 air battles in all. There's more, more, more . . . once-in-a-lifetime collections like "One of a Kind" which covers in photo and extensive data form 53 amazing civilian craft . . . "Secrets of Japan's Air Power" which has been acclaimed around the world shows pictures of aircraft—photos that the Japanese no longer have in their files! . . . and how can we conclude this completely inadequate report without mentioning Pete Bowers' "Saga of the Curtiss Hawks." Play it smart; obtain your copy while it's still in print! Ask for your copy of the 53/54 edition. BY MAIL: 50c to U.S. and Possessions; Canada, 60c; $1 elsewhere.

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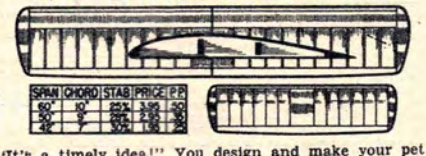

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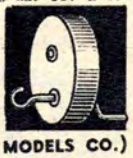

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(Continued from page 75)

5. All hard tube receivers are bothered by "electrical noise" in the plane. Worst offender in this respect is the linkage to the escapement, especially if the latter is mounted in the front of the ship, with a long wire push or torque rod to the rudder. Best way out of this is to use a wooden torque rod, or to isolate the rod from the escapement by using a piece of bakelite somewhere in the linkage. Bonding the metal parts with very flexible wire is OK, but bonds *can* break.

6. As batteries drop from use, the idling current will get lower, and the on-signal current will be higher. If the relay is correctly set, you should be able to use the batteries till the A drops to about 1.3 V. and the B to 40 V.

7. Best way to check final tuning and sens. control settings, when you are a good distance from the transmitter, is to lift the plane over your head on the end of a stick or pole about 6 ft. long. This gets it away from the ground, and it will work much as it does when it is several hundred feet in the air. Next best way is to hold the plane as high as you can *by the wing tips;* keep your hand away from the fuselage to reduce capacity between you and the set, batteries and wiring.

Parts List

L1—CTC type LSM coil form with red core (see dwg). L2—RF choke: Control Research. L3—Quench transformer: Electronic Spec. Supply Co. (Small type with wire leads, no lugs). Ry—E.D. non-polarized relay, 5000 ohms: Polk's. C1—50 mmf. cond.: CRL type D6. C2—170-780 mmf. trimmer condenser: Arco type 469. C3—100 mmf. cond.: CRL type D6. C4—.05 mf. paper cond. 150 V. miniature type. Tube—Raytheon CK526AX sub-miniature. Socket—Sub-min. 5 prong. R—390,000 ohms ½ W. carbon. Base plate—linen bakelite, 1½" x 2⅛" x 1/16" thick. Three small rivet-type lugs: Control Research. Wire for coils, mounting clips, material for tube clamp, battery leads.

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AIR TRAILS Hobby Shop Directory

Model Builders! Here's a listing of the nation's leading hobby shops. You'll want to file it away—and when you're in the neighborhood, drop in and browse around. They're expecting you.

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Air Notes

FAIRCHILD is latest U.S. manufacturer to enter jet airliner field, with "cusp" wing M-186 commercial jet transport plane. Wing shape, though similar to the British "crescent," is combination of delta and straight wing. Proposed powerplants are two Wright J-67's, each rated at better than 12,000 lbs. thrust, buried in root section of the 100 ft. wing. Passenger capacity to be between 44 and 64, gross weight 75,800 lbs. and cruising speed 570 mph at 40,000 ft. Fairchild is working on reverse thrust device for M-186 to reduce landing run of craft. Plane is still in early design stage; no predictions made when prototype will be built, since this depends upon how interested are air lines and the military.

★ ★ ★

BOEING is going ahead with its version of a jetliner, the model 707. Typical of Boeing, the four-jet swept-wing aircraft will have its powerplants mounted on external pods. Wingspan will be 130 ft., passenger capacity from 80 to 120. . . . DOUGLAS SKYROCKET reached speed of 1372 mph, equivalent to twice the speed of sound at the altitude flown. Plane was piloted by Scott Crossfield of NACA. . . . MOST LUXURIOUS airliner is Air France's "Golden Parisian" Super Connie in service between New York and Paris. Normally capable of carrying 87 passengers, this Super Connie had its capacity limited to 32, and is equipped with eight "Skyroom" compartments accommodating 16 passengers, plus 16 reclining sleeper chairs and double lounge.

★ ★ ★

AIR FORCE lowered requirements for pilot training, accepts high school graduates. At least two years of college education was formerly needed to qualify for flight training. Move was necessitated to assure required 7200 annual pilot production rate. . . . SWEDISH all-weather interceptor "Lance" attained speed of sound in a dive recently. Number of the planes are under construction for the Swedish AF, will form backbone of that country's defense forces. . . . UNITED STATES Off-Shore purchases for 1954 will include 920 Hawker Hunters for England, Holland and Belgium, 250 Supermarine Swifts for England, 112 Hawker Sea Hawks for England, 393 Mysteres for France and 50 F-86s for Italy.

(*Continued on next page*)

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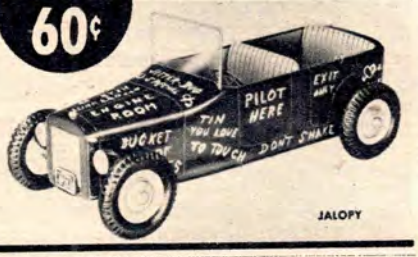

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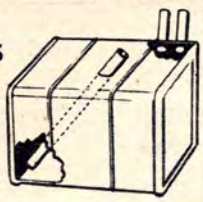

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(Continued from preceding page)

RUSSIAN AIR FORCE is assessed at close to 40,000 aircraft, of which some 25 are Type 31 strategic turboprop bombers about the size of our B-36. . . . DOUGLAS F4D-1 Skyray successfully passed take-off and landing tests aboard the carrier Coral Sea. . . . NORTH AMERICAN F-82 Twin Mustang all-weather fighter retired from service. Last operational unit equipped with F-82s was the 449th Fighter Interceptor Squadron located at Ladd AFB, Alaska.

★ ★ ★

PRESIDENT EISENHOWER presented the Harmon International Trophy, top award in aviation, to Col. Bernt Balchen, Arctic aviator; Mme. Jacqueline Auriol of France, first woman to fly a jet plane.

CONTEST CALENDAR

List meets here! Advise Air Trails not less than 90 days in advance. If any area restrictions on entries, be sure to state. Address of contact man in same city as site of meet unless otherwise specified. (Give telephone No. of contact man when possible.) When info on events is furnished these are abbreviated as follows: indoor rubber powered—IR; outdoor rubber powered—OR; outdoor hand launched glider—OHLG; indoor glider—IG; towline gliders—TL; free flight gas—FF; control line speed—SP; control line scale—CLSC; control line stunt—ST; team racing—TR; combat—COM; radio control—RC; rise-off water free flight—ROW; carrier models—CAR; free flight scale—FFSC; non-flying exhibition scale—NFSC; jet speed—J; contpoline endurance—CLEND; Wakefield—WAK; PAA-Load—PAA.

NEW JERSEY—Haddonfield, Jan. 10. Highway Glo-Bugs' annual Polar Bear meet. L. E. Williams, 317 Richey Ave., Collingswood.

CALIF.—Los Alamitos, Jan. 17. Long Beach Thunderbugs F.A.N. gas meet. F. L. Swaney, 527 E. 55th St., Long Beach.

MINN.—White Bear Lake, Jan. 24. Polar Buzz Buggs 3rd annual winter meet. FF; TL; ONLG; ST; SP; J; COM; RC. L. C. Gray, 2300 Gall Ave., N. St. Paul.

NEW JERSEY—Hillside, Jan. 31. Aeronuts 1st annual meet. SP; ST; TR; BEAUTY. R. E. Rosenthal, 4 Girard Pl., Newark 8.

ARIZ.—Tucson, Jan. 31. Thermaleers 3rd annual Roundup. C. R. Downs, 1035 E. 6th.

ARIZ.—Phoenix, Feb. 14. Annual Southwest Regional contest by PMAC. Q. T. Webster, 934 E. Van Buren. (See also contest mentions in Dope Can, R/C, Southern Scene, and Western Roundup columns.)

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While every precaution is taken to insure accuracy we cannot guarantee against the possibility of an occasional change or omission in the preparation of this February 1954 index.

and Walter L. Massic, chief dirigible pilot of Goodyear Aircraft Corp. . . . NORTHROP F-89 Scorpion all-weather interceptors now in operation with Alaskan Air Command, Elmendorf AFB, on 24-hour guard duty. . . . USING a light plane, a California game warden stocked 662 lakes with 2,864,000 fish last summer. This cut cost by $52,000 over the older method employed.

★ ★ ★

McDONNELL AIRCRAFT CORP. delivered the last Banshee twin-jet fighter designated F2H-4 to the Navy. More than 800 Banshees were built. McDonnell will now concentrate on production of F3H-1 Demon for the Navy and the F-101 for the Air Force. . . . STRATEGIC AIR COMMAND'S first sports car races at air bases netted AF personnel $200,000. All events were conducted with cooperation of the Sports Car Club of America.

★ ★ ★

CANADIAN PACIFIC AIRLNES, first air transport company in western hemisphere to order jetliners, have placed an additional order for three Comet 2s with de Havilland. Comet 2 is a larger and faster version of the Comet 1, with capacity of 44 passengers, is powered by Rolls-Royce Avon jets. Still larger model, Comet 3 with 58-passenger capacity, has been ordered by BOAC (British Overseas Airways Corp.). . . . SPERRY GYROSCOPE CO.'S new Gyrotron gyroscope operates on principle of tuning fork instead of rotating mass, is based on halteres or balancers, small vibrating reed-like devices located beneath a fly's wing which help it to maintain its balance in flight. Gyrotron is being installed in automatic pilots.

★ ★ ★

PIASECKI H-21 Work Horse, transport helicopter, undergoing Arctic tests at Thule AFB in Greenland by the Army Arctic Transportation Group. The YH-16, 40-passenger transport helicopter, is being extensively flight-tested at Piasecki's Philadelphia plant. . . . NATIONAL AIRLINES' Convair 340 twin-engine transport spanned the continent from San Diego, Calif., to Miami, Fla., in seven hours and eight minutes on delivery flight. Average speed was 325 mph with the help of a 15 mph tail wind. . . . CONVAIR rushing construction on second XF-102 delta wing fighter after the first one was wrecked during test flight at Edwards AFB. Cause of accident was loss of power on take-off. . . . TURBOPROP powered Cessna L-19B has set a new altitude record of 37,063 ft. Plane is powered by the 200 hp Boeing turbine engine. In the meantime, Cessna has received an additional order of 100 Cessna L-19A Bird Dog liaison planes. These will be used by Army Field Forces.

★ ★ ★

ACCURATE replica of Wright brothers' first airplane was constructed by the Northrop Institute. More than twenty various aircraft industry organizations cooperated with Northrop in the project, supplying them with sections and component parts of the airplane. The Wright plane is to be exhibited at the Institute of Aeronautical Sciences in Los Angeles. . . . ROYAL CANADIAN NAVY has ordered 60 F2H-3 Banshee jet fighters to operate from carrier HMCS Magnificent. . . . INDIAN Air Force has ordered 71 Marcel Dassault Ouragan jet fighters from France; four of the craft have already been delivered. . . . U. S. NAVY has 9940 airplanes, according to Secretary of the Navy Robert B. Anderson. . . . ONE 600 mph jet bomber can drop bombs on New York, Philadelphia, Baltimore and Washington all in a period of 22 min.

GRUMMAN F9F-5 Panther, the "Willie Love 2" of the 1st Marine Aircraft Wing, was awarded a citation by 1st Wing Commander Gen. V. E. Megee, USMC. Meritorious achievement of Willie Love 2 included 445 missions over Korea for a total of 1002 combat hours during which the plane dropped 400,000 lbs. bombs, rockets and napalm, and wore out 16 cannons using up over 100,000 rounds of 20-mm ammunition.

★ ★ ★

BOEING B-47 bomber flew from Fairford, England, to Tampa, Fla., the 4450 mile journey being made in 9 hours 53 minutes, at an average speed of 454 mph. The plane was refueled in the air. . . . WB-29 (W for weather) of USAF Weather Service, 57th Reconnaissance Squadron, flew a total of 366 hours 20 minutes in one month, exclusively on weather missions. Mission consists of a triangular course of 3240 miles; during the run weather observations are taken every 100 miles and radioed back to home base at Hickam Field, Hawaii.

★ ★ ★

AIR FORCE has taken some of the wraps off Pratt & Whitney J-57 turbojet by revealing that it is the first U.S. powerplant of this type to reach the coveted 10,000 lb. thrust figure. The J-57 already powers the record-breaking North American F-100 Super Sabre, the Boeing B-52, and the Convair XF-102, is slated to go into the Douglas F4D-1 and A3D as well as the McDonnell F-101. . . . NORTH AMERICAN AVIATION has delivered its 50,001st airplane since it started in business. . . . AIR FORCE officers who flew the Russian MiG-15 recently flown to an Air Force base by a North Korean pilot claim that the Communist fighter is definitely inferior to the F-86. Plane is slower than the Sabre in level flight, has insufficient stall warning, cramped cockpit, inefficient heating and ventilating system, and poor stability at high altitude which keeps pilot so busy flying that he can devote little attention to fighting.

Super Aerotrol

(*Continued from page* 56)

Instruction Manual covers conversion of the De-Aerotrol receiver to 27¼ mc. operation; the transmitter can be converted to the amateur 27 or 28 mc. bands, but cannot be used on 27¼ mc., since it is not crystal-controlled.

Specifications

Receiver. Single gas tube type fitted with sensitizer for better range. Entire receiver mounts on base 1⅜x2⅜" and is about 1¾" high. Wt. with battery leads and tube—2¼ oz. On-off switch, meter jack and plug and potentiometer add about ½ oz. Relay in kit furnished fully adjusted, as it is in finished receiver.

Battery complement: A—two pencells in parallel (Eveready 915 or equivalent), 1½ V at 50 ma. B—two 22½ V. batteries in series (Eveready 412 or equiv.) Idling current about 1.4 ma.; with signal, current drops to around .2 ma. Lightest recommended battery supply, as above—3½ oz.

Adjustments: variable antenna coupling condenser. Screw core for setting frequency. Relay adjusted by bending components. Sensitizer.

Transmitter. Case size, 8½x4½x3", less antenna holder. Weight with batteries 4 lbs. Antenna projects about 43¼ ft. above case; it is two-section type, 2¾ ft. long when collapsed. Antenna attached by a single wing nut.

Batteries: Case holds two 67½ V. B batteries (Eveready 467 or eq.) and one 1½ V. A cell (Eveready 742 or eq.) A current—200 ma. B—135 V. at about 20 ma. (B current drawn only when key is depressed).

R.C. AT ITS' FINEST

SUPER AEROTROL

READY-TO-OPERATE Radio Control

27mc. Crystal Control

NO OPERATORS LICENSE REQUIRED!

Only $49.95

Including:

TRANSMITTER; ANTENNA; RECEIVER; ESCAPEMENT; & O-3 MILLIAMMETER.

For Those Who Want to Build Their Own-

The finest Radio Control Assembly Kits that money can buy. No surplus components-no used parts. Every part engineered for its specific job. Proven by over five thousand satisfied users.

"Super Aerotrol" Crystal Controlled TRANSMITTER

In Kit Form: less tube $19.95

- Portable — Self contained — No separate antenna — No external Batteries!
- Operates on 27.2 mc. • Weighs 3.5 lbs.

Kit includes all necessary parts (except tube and batteries): Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensors, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.

"Super Aerotrol" Dust Core Tuned RECEIVER

In Kit Form: less tube $13.95

- NEW "locked-channel" dust-core tuning.
- Light in Weight, 2¾ oz. less batteries.
- Super-regenerator circuit, dependable.

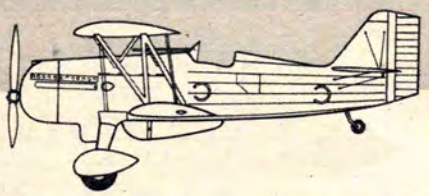
Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensors and eyelets attached; all electrical components, condensors, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete instructions are included.

buy BERKELEY at your dealer!

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. AT., West Hempstead, N.Y. Please include 25¢ packing & postage.

MUCH MORE-

DETAIL - VALUE - PERFORMANCE



$4.95

Berkeley's

Controliner

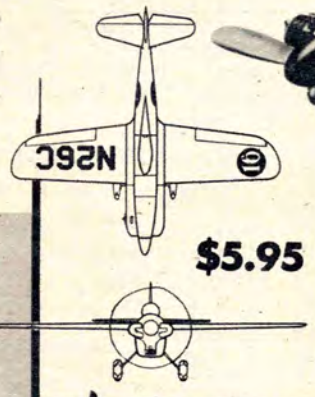
CURTISS HAWK "P-6E"

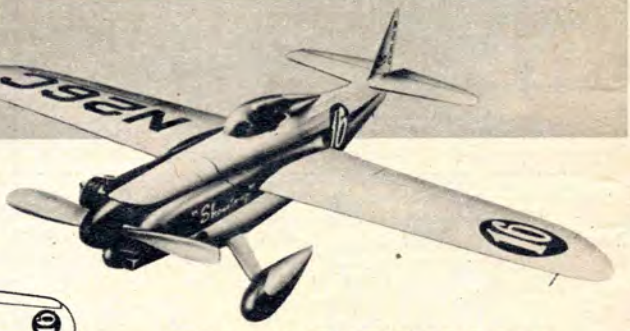
For .09 to .15 Engines — ¾" Scale — 23¾" Wingspan

- Deep Drawn Metal Cowl!
- Stamped Metal Wing Struts!
- Formed Metal Wheel Pants!
- Metal Rudder, Elevator Hinges!
- Formed Wire Landing Gear!
- Jim Walker "U-Control" System!
- "Autotrol" Rudder System!
- Rubber Wheels, Hardware!
- Authentic Decals in 4 colors!
- Full Size Detailed Plans!
- Shaped Fuselage Sections!
- Side Profile Assembly Keel!
- Shaped and Notched Wing Edges!
- Die-Cut Balsa and Plywood!
- Celluloid, Covering Tissue!

Designed by Don McGovern and Bill Effinger

The Curtiss Hawk "P-6E" is one of the great historical models of the Air Force. It was our best pursuit ship of the early 1930's. Berkeley's model is authentic, scaled without deviation from rare service manuals supplied to us by the Air Force Technical Museum. The complete decals for the famous "17th Pursuit Squadron" from Selfridge Field, Mich. make it a really beautiful model to own and fly.





$5.95

"SHOESTRING"

For .14 to .36 Engines — 28" Wingspan

This Continental Trophy winner makes a perfect 1½" scale controline model. The kit includes genuine Jim Walker "U-Control"; metal hardware; formed metal wheel pants; metal spinner; formed sheet metal landing gear; metal bushed rubber wheels; die-cut balsa; plastic bubble canopy; fuelproof decals; hardwood mounts; die-cut plywood; covering material; full size detailed plans.

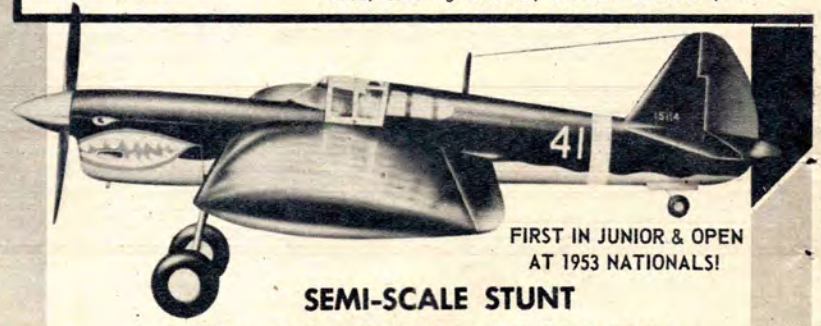
Army Liaison YL-24 **"HELIOPLANE"**

Variable Camber Wing for Two-Speed Radio Control Flying

For .049 to .14 Engines — 39" Wingspan — 1" Scale

$3.95

Operating wing flaps may be used for two-speed flight. Depress 10° for free-flight, 25° for slow radio control flights, or raise 5° for high speed flight. Fuelproof decals; shaped and die-cut parts, wheels, etc. Detailed full size plans show radio installation.



FIRST IN JUNIOR & OPEN AT 1953 NATIONALS!

Cessna L-19 **"BIRD DOG"** **$2.95**

For Free-Flight Gas — Controline — Rubber Power

.035 to .049 Engines for Free-Flight .049 to .099 Engines for Controline

In active duty in Korea, this new liaison plane is perfect in proportions for model work. Plans show it as a free-flight "½A" gas, with details for rubber and controline conversion. Fuelproof decals, die-cut balsa, plywood and celluloid; shaped and notched wing edges; formed gear, etc.

SEMI-SCALE STUNT

"P-40 WARHAWK"

For .19 to .36 Engines — 45" Wingspan

This beautiful semi-scale stunt controline won first in Open and first in Senior at the Tangerine Internationals. Die-cut balsa; silk-screened celluloid canopy; complete metal hardware including Jim Walker "U-Control"; metal cowl; fuelproof Flying Tiger decals; stunt flaps.

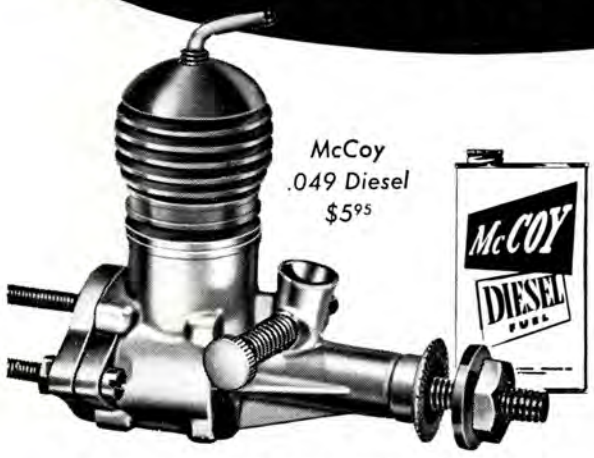
$4.95

buy BERKELEY at your local dealer!

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. AT., West Hempstead, N. Y. Please include 25¢ packing & postage.

The Sky's Full of McCoys

"TO BE A CHAMPION... BEG, BORROW, OR BUY A McCOY ENGINE"



MEET PAA CLIPPER CARGO CHAMPION Hal Roth *of Berkeley, California. His "Blueboy" with a borrowed McCoy Diesel engine set a new AMA record of 23¼ oz. for 42 seconds.*

LET HIM TELL YOU IN HIS OWN WORDS HOW IT WAS DONE:

"I *borrowed* a McCoy Diesel because it has just the right power required for the Clipper Cargo event. And it convinced me... now, I *own* one!

"My ship 'Blueboy' has a wingspan of 72" with 7" chord; stabilizer, 22½" with 5" chord. Weight without cargo box was 6½ oz.

"Wing and stabilizer covering was pre-war Jap tissue with two thin coats of nitrate dope. Fuselage was sheet balsa with one coat of blue dope... rudders not covered or doped—just raw sheet balsa for weight reduction. Wing construction was normal—a 1/32" sheeting on leading wing edge for rigidity but light weight. This was necessary because of the high aspect ratio—better than 10 to 1.

WHEELS ARE IMPORTANT—"Landing gear was a two-strut type made of 1/16" piano wire. Two-strut gear is more rigid, lighter, and easier to securely mount than corresponding one-strut gear. Also, two strut gear stays in alignment. Location was immediately forward of the cargo box or considerably aft of usual gas model landing gear installations. Aluminum wheels were made by a fellow Oakland Cloud Duster. They are 1" diameter and 1/32" thick with 1/8" diameter hub, ¼" wide. Wheels are true running and wobble free because of wide hub and don't squash as do ordinary rubber wheels. Inasmuch as take-off run is some 30 to 40 feet, wheels are important.

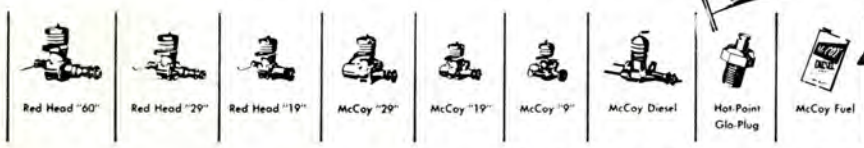
PROPELLERS COUNT TOO—"Various propellers were tried. One, the winning flight of 23¼ oz., a 7x3 Top Flite was used. A 7x2 Tornado worked well also and allowed engine to develop more RPM. On an unofficial flight (due to engine over run) the ship lifted 26½ oz. with a 7x2 Tornado for 2:40. The more load, the more effective pulling power required *from a standstill.* This is best had by a low pitch prop.

McCOY DIESEL JUST RIGHT—"A McCoy Diesel had just the power required—ability to swing a low pitch 7" prop at high RPM. McCoy fuel (which is excellent in all respects), allows use... and broad use... in not only McCoy Diesel engines but all other Diesels, especially foreign makes. Starting procedure is different from glo-plug type and takes a bit of practice to master. Diesels start easy. All in all, the McCoy Diesel has extremely high power, is lightweight and easy to mount. It is capable of much more power than comparable glo-type engines, swings a low pitch 7" prop while glo-plug engines swing a 5x3. The Diesel has another big advantage—fuel residue is not harmful to the model's finish.

BIG FUTURE FOR DIESELS—"In conditions such as at the Nationals, with a good runway and about a 12 MPH wind, I believe the 'Blueboy' capable of lifting 30 oz. dead weight. Above 30 oz., a shock absorbing landing gear will be needed and construction must be stronger. But 30 oz.—about five times the weight of the model—isn't bad."

Hal Roth

McCoy *famous "Checkered Flag" line...*



McCOY®
PRODUCTS COMPANY

8509 HIGUERA STREET ★ CULVER CITY, CALIFORNIA

World's First SHOCK-PROOF DIESELS!

OK CUB .049 DIESEL

Disp: .049 cu. in. or .83 cc.
Height: 2 7/16"
Weight: 1½ oz., including fuel tank

$5.95 *as illustrated*

"OK" CUB .075 DIESEL

Disp: .075 cu. in. or 1.25 cc.
Height: 2⅝"
Weight: 2 oz., including fuel tank

$7.50

Now . . . after 38 years of research and development by Charles Brebeck, designer of "OK" engines, Herkimer has come up with a series of tried and proven advanced-design diesels that can really take it.

Both the .049 and .075 Cub Diesels include radically new and improved features which enable these rugged little power plants to "roll with the punch". Your dealer now has the new "OK" Diesels, Diesel Fuel and all the exciting details. Check with him, or write direct.

"OK" Diesels require no ignition accessories — no batteries . . . no plugs . . . no harness . . . no connecting clips. All you need is *"OK" Cub Diesel Fuel* specially developed for "OK" Cub Diesels.

Pint . . . **85c**

Exclusive shock absorber pad and pulsating contra piston (patents pending) make "OK's" the first practical long-life diesels . . .

(a) *Adjusting screw*

(b) *Cylinder head*

(c) *Shock absorber pad*

(d) *Contra piston*

(e) *Sealing ring*

(f) *Piston and connecting rod*

Compression ratio is adjusted by screw (a). Explosive force within the combustion chamber acting against the "floating" steel contra piston (d) is absorbed by springy metal shock pad (c). Thus, impact stresses are minimized and crankshaft, connecting rod, wrist pin, crankcase, cylinder and cylinder head are protected and last longer.

HERKIMER TOOL & MODEL WORKS

78 HARTER STREET — HERKIMER, N. Y.